



STIC Search Report

EIC 1700

STIC Database Tracking Number: 145757

TO: Sanza McClendon
Location: REM 10D70
Art Unit : 1711
March 3, 2005

Case Serial Number: 10/712589

From: Kathleen Fuller
Location: EIC 1700
REMSSEN 4B28
Phone: 571/272-2505
Kathleen.Fuller@uspto.gov

Search Notes



STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

➤ I am an examiner in Workgroup: Example: 1713

➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28



=> FILE REG

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Property values tagged with IC are from the ZIC/VINITI data file
provided by InfoChem.

STRUCTURE FILE UPDATES: 1 MAR 2005 HIGHEST RN 840454-17-3
DICTIONARY FILE UPDATES: 1 MAR 2005 HIGHEST RN 840454-17-3

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

Please note that search-term pricing does apply when
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more
information enter HELP PROP at an arrow prompt in the file or refer
to the file summary sheet on the web at:
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> FILE HCAPLU

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FILE COVERS 1907 - 3 Mar 2005 VOL 142 ISS 10
FILE LAST UPDATED: 2 Mar 2005 (20050302/ED)

This file contains CAS Registry Numbers for easy and accurate
substance identification.

=> D QUE

L4 148391 SEA FILE=REGISTRY ABB=ON 46.492.16/RID
L5 1240 SEA FILE=REGISTRY ABB=ON L4 AND 8-50/F
L6 96 SEA FILE=REGISTRY ABB=ON L5 AND 1-2/S AND 3-20/O
L7 40 SEA FILE=HCAPLUS ABB=ON L6
L9 0 SEA FILE=HCAPLUS ABB=ON L7 AND ELECTROLYT?
L10 0 SEA FILE=HCAPLUS ABB=ON L7 AND ELECTROLYT?
L11 100102 SEA FILE=HCAPLUS ABB=ON L4
L12 724 SEA FILE=HCAPLUS ABB=ON L11 AND ELECTROLYT?
L13 48 SEA FILE=HCAPLUS ABB=ON L12 AND MEMBRANE?
L14 7 SEA FILE=HCAPLUS ABB=ON L13 AND ?FLUORI?

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

Handwritten note: ring identifier for
L4

L15 9 SEA FILE=HCAPLUS ABB=ON L13 AND ?FLUORO?
 L16 11 SEA FILE=HCAPLUS ABB=ON L14 OR L15
 L17 55 SEA FILE=HCAPLUS ABB=ON L12 AND ?NITRIL?
 L18 1 SEA FILE=HCAPLUS ABB=ON L17 AND ?TRIMER?
 L19 938 SEA FILE=HCAPLUS ABB=ON ?TRIMER?(4A)?NITRIL?
 L20 126 SEA FILE=HCAPLUS ABB=ON L11 AND L19
 L21 0 SEA FILE=HCAPLUS ABB=ON L20 AND (MEMBRANE? OR ELECTROLYT?)
 L22 44 SEA FILE=HCAPLUS ABB=ON L20 AND (POLYMER? OR PLASTIC?)/SC,SX,A
 B,BI
 L23 9 SEA FILE=HCAPLUS ABB=ON L22 AND (?FLUORO? OR ?FLUORI?)
 L24 21 SEA FILE=HCAPLUS ABB=ON L9 OR L10 OR L16 OR L18 OR L21 OR L23

 L27 707161 SEA FILE=REGISTRY ABB=ON (C(L)F(L)S(L)O)/ELS
 L31 72307 SEA FILE=HCAPLUS ABB=ON ?NITRIL?(L)RCT/RL
 L35 288702 SEA FILE=REGISTRY ABB=ON L27 AND SULFON?
 L36 86049 SEA FILE=HCAPLUS ABB=ON L35
 L37 12 SEA FILE=HCAPLUS ABB=ON L36 AND L19
 L38 5167 SEA FILE=HCAPLUS ABB=ON L31 AND L35
 L39 56 SEA FILE=HCAPLUS ABB=ON L38 AND ELECTROLYT?
 L40 6 SEA FILE=HCAPLUS ABB=ON L39 AND MEMBRANE?
 L41 9 SEA FILE=HCAPLUS ABB=ON L39 AND CROSSLINK?
 L42 3463 SEA FILE=HCAPLUS ABB=ON L11 AND L36
 L43 126 SEA FILE=HCAPLUS ABB=ON L42 AND L31
 L44 1 SEA FILE=HCAPLUS ABB=ON L43 AND ELECTROLYT?
 L45 2 SEA FILE=HCAPLUS ABB=ON L43 AND CROSSLINK?
 L46 3 SEA FILE=HCAPLUS ABB=ON L43 AND MEMBRANE?
 L47 30 SEA FILE=HCAPLUS ABB=ON L37 OR L40 OR L41 OR (L44 OR L45 OR
 L46)
 L48 50 SEA FILE=HCAPLUS ABB=ON L47 OR L24
 L51 37 SEA FILE=HCAPLUS ABB=ON L48 AND (POLYMER? OR PLASTIC?)/SC,SX,A
 B,BI

=> D L51 BIB ABS HITIND HITSTR 1-37

L51 ANSWER 1 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:704217 HCAPLUS
 DN 141:367031
 TI Radiation-grafted solid **polymer electrolyte**
membrane: Studies of **fluorinated** ethylene propylene
 (FEP) copolymer-g-acrylic acid grafted **membranes** and their
 sulfonated derivatives
 AU Patri, M.; Hande, V. R.; Phadnis, Swati; Deb, P. C.
 CS Naval Materials Research Laboratory, Ambernath, 421 506, India
 SO Polymers for Advanced Technologies (2004), 15(8), 485-489
 CODEN: PADTE5; ISSN: 1042-7147
 PB John Wiley & Sons Ltd.
 DT Journal
 LA English
 AB Acrylic acid was grafted onto FEP by simultaneous radiation technique and
 the resulting **membranes** were sulfonated. Results of dynamic
 mech. properties of the **membranes** showed that storage modulus
 and temperature at tan δ (max) increases on grafting. X-ray diffraction
 (XRD) anal. of the grafted and sulfonated **membranes** showed
 decreasing trend in crystallinity with increase in degree of grafting.
 From SEM studies it was confirmed that grafting takes place by the front
 mechanism.
 CC 38-3 (**Plastics** Fabrication and Uses)
 Section cross-reference(s): 35

ST acrylic acid grafted **fluorinated** ethylene propylene copolymer
membrane sulfonated; dynamic mech property crystallinity
membrane

IT **Polymerization**
(graft, radiochem.; radiation-grafted solid **polymer**
electrolyte membranes)

IT Crystallinity
Glass transition temperature
Membranes, nonbiological
Polymer morphology
Storage modulus
Sulfonation
(radiation-grafted solid **polymer electrolyte**
membranes)

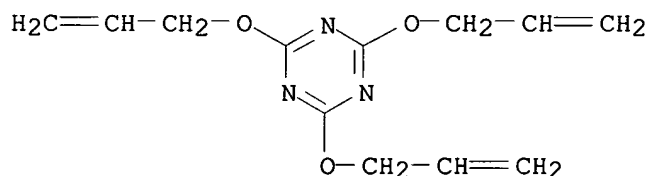
IT Complex modulus
(tan δ ; radiation-grafted solid **polymer**
electrolyte membranes)

IT 79-10-7DP, Acrylic acid, grafted onto **fluorinated** ethylene
propylene copolymer, then sulfonated 101-37-1DP, Triallyl
cyanurate, reaction products with acrylic acid and **fluorinated**
ethylene propylene copolymer, then sulfonated 9010-79-1DP,
Ethylene-propylene copolymer, **fluorinated**, acrylic acid grafted,
then sulfonated
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Préparation)
(radiation-grafted solid **polymer electrolyte**
membranes)

IT 101-37-1DP, Triallyl cyanurate, reaction products with acrylic
acid and **fluorinated** ethylene propylene copolymer, then
sulfonated
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Préparation)
(radiation-grafted solid **polymer electrolyte**
membranes)

RN 101-37-1 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(2-propenyloxy)- (9CI) (CA INDEX NAME)



RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 2 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:609801 HCAPLUS
DN 141:126391
TI Method of fabrication of electrode for secondary battery having intrinsic
polymer electrolyte
IN Ohsawa, Yasuhiko; Hisamitsu, Yasunari
PA Nissan Motor Co., Ltd., Japan
SO U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

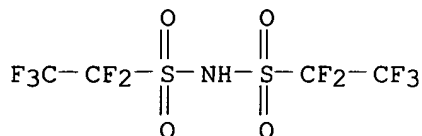
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004146781	A1	20040729	US 2003-733286	20031212
	JP 2004234879	A2	20040819	JP 2003-18632	20030128
	EP 1443574	A1	20040804	EP 2003-28736	20031212
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
PRAI	JP 2003-18632	A	20030128		
AB	A secondary battery electrode comprises a collector, and an active material layer formed on the collector. Further, the active material layer comprises first active material layer components including an electrode active material, binder and first polar polymer , and second active material layer components including a second polar polymer , and being placed in voids between the first active material layer components. The secondary battery electrode is used in a secondary battery having an intrinsic polymer electrolyte .				
IC	ICM H01M004-02				
	ICS H01M004-62				
NCL	429209000; 429217000; 429210000				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)				
	Section cross-reference(s): 38				
ST	electrode secondary battery intrinsic polymer electrolyte				
IT	Fluoropolymers, uses				
	RL: MOA (Modifier or additive use); USES (Uses) (binder; method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	Secondary batteries				
	(lithium; method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	Battery cathodes				
	Battery electrolytes Polymer electrolytes (method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	Carbonaceous materials (technological products)				
	Polyethers, uses				
	RL: DEV (Device component use); USES (Uses) (method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	Membranes , nonbiological				
	(polymer; method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 24937-79-9, PvdF				
	RL: MOA (Modifier or additive use); USES (Uses) (binder; method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 132843-44-8				
	RL: DEV (Device component use); USES (Uses) (method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	78-67-1, Azobisisobutyronitrile 24650-42-8				
	RL: RCT (Reactant) ; RACT (Reactant or reagent) (polymerization initiator; method of fabrication of electrode for secondary battery having intrinsic polymer electrolyte)				
IT	132843-44-8				

RL: DEV (Device component use); USES (Uses)

(method of fabrication of electrode for secondary battery having
intrinsic **polymer electrolyte**)

RN 132843-44-8 HCAPLUS

CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(pentafluoroethyl)sulfonyl]-,
lithium salt (9CI) (CA INDEX NAME)



● Li

L51 ANSWER 3 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:431502 HCAPLUS

DN 141:126244

TI Proton Conductive Polyimide **Electrolytes** Containing Fluorenyl
Groups: Synthesis, Properties, and Branching Effect

AU Miyatake, Kenji; Zhou, Hua; Watanabe, Masahiro

CS Clean Energy Research Center, University of Yamanashi, Kofu, 400-8510,
Japan

SO Macromolecules (2004), 37(13), 4956-4960

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

AB Novel sulfonated polyimide copolymers as **electrolytes** for
high-temperature fuel cell applications are reported. Sulfonated polyimide
copolymers (SPIH-X; X refers to molar percentage of fluorenyl content)
containing 0-60 mol % of fluorenyl groups as hydrophobic component were
synthesized, of which **electrolyte** properties were studied and
compared to those of the **perfluorinated** ionomer (Nafion 112).
High-mol.-weight copolymers with good film-forming capability were obtained.
Thermal stability with decomposition temperature of ca. 280 °C and no glass
transition temperature was confirmed for the copolymers. SPIH shows unique
water uptake behavior with the maximum value of 57% at X = 30. Water mols.
absorbed in the **electrolyte membrane** with this
specific composition do not evaporate easily so that the high proton
conductivity of 1.67

S cm⁻¹ was obtained at 120° and 100% RH. The branching and
crosslinking of SPIH-30 were carried out by applying 2 mol % of
trifunctional monomer (melamine) in the **polymerization** and by electron
beam irradiation upon the **membrane**. The branching and crosslinking
are effective to improve oxidative stability and mech. strength. Although
the proton conductivity decreases slightly by the branching and crosslinking,
it

still remains at the comparable level to that of Nafion 112.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 35, 38, 72, 76

ST proton conductive polyimide **electrolyte** fluorenyl group
branching sulfonated **membrane**; fuel cell separator
membrane polyelectrolyte arom polyimide mech strength

- IT Polyimides, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (fluorene group- and **fluorine**-containing, cardo, aryl, sulfonate-containing; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Polyoxyalkylenes, uses
 RL: DEV (Device component use); USES (Uses)
 (**fluorine**- and sulfo-containing, ionomers, electrode binder; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Current density
 (from methanol crossover, voltage and humidity effect on; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Electric current-potential relationship
 (of assembled fuel cell; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Stability
 (oxidative; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Carbon fibers, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (paper, anode support; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT **Fluoropolymers**, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (polyimide-, fluorene group-containing, cardo, aryl, sulfonate-containing; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Cardo **polymers**
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (polyimides, fluorene group- and **fluorine**-containing, aryl, sulfonate-containing; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT **Fluoropolymers**, uses
 RL: DEV (Device component use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers, electrode binder; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Ionomers
 RL: DEV (Device component use); USES (Uses)
 (polyoxyalkylenes, **fluorine**- and sulfo-containing, electrode binder; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Ion exchange **membranes**
 (preparation and ion exchange capacity of; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes**)

- containing **trifluoromethyl** groups)
- IT Ionic conductivity
(proton; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Crosslinking
(radiochem.; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Fuel cell separators
Fuel cells
 Membrane electrodes
 Membranes, nonbiological
Polyelectrolytes
(synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Carbon black, uses
RL: DEV (Device component use); USES (Uses)
(synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT **Fluoropolymers**, uses
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 117-61-3P, 4,4'-Diamino-2,2'-biphenyldisulfonic acid
RL: PUR (Purification or recovery); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(DAPS; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 15499-84-0, 4,4'-(9-Fluorenylidene)dianiline
RL: RCT (Reactant); RACT (Reactant or reagent)
(FDA; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 7732-18-5, Water, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(absorption of; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 7720-78-7, Ferrous sulfate
RL: CAT (Catalyst use); USES (Uses)
(for oxidative stability; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 500783-35-7P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(plain and crosslinked; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 42615-02-1
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(synthesis, properties, and DMFC performance of proton conductive

polyimide **electrolytes** containing **trifluoromethyl** groups)

IT 67-56-1, Methanol, uses
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT 7440-06-4, Platinum, uses 7440-57-5, Gold, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT 108-39-4, m-Cresol, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT 481001-37-0P **724457-95-8P**
 RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT 163294-14-2, Nafion 112
 RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT 65-85-0, Benzoic acid, reactions 81-30-1, 1,4,5,8-Naphthalenetetracarboxylic dianhydride **108-78-1**, Melamine, reactions 121-44-8, Triethylamine, reactions 7722-84-1, Hydrogen peroxide, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

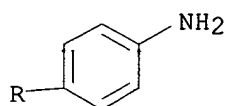
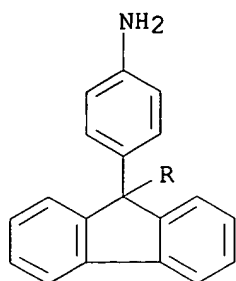
IT **724457-95-8P**
 RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

RN 724457-95-8 HCAPLUS
 CN [1,1'-Biphenyl]-2,2'-disulfonic acid, 4,4'-diamino-, compd. with N,N-diethylethanamine (1:2), polymer with [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone, 4,4'-(9H-fluoren-9-ylidene)bis[benzenamine] and 1,3,5-triazine-2,4,6-triamine (9CI) (CA INDEX NAME)

CM 1

CRN 15499-84-0

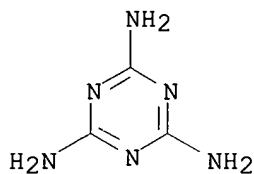
CMF C25 H20 N2



CM 2

CRN 108-78-1

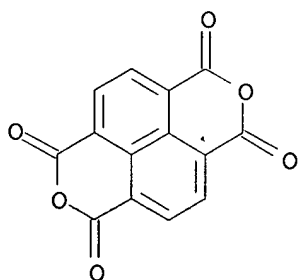
CMF C3 H6 N6



CM 3

CRN 81-30-1

CMF C14 H4 O6



CM 4

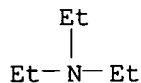
CRN 481001-36-9

CMF C12 H12 N2 O6 S2 . 2 C6 H15 N

CM 5

CRN 121-44-8

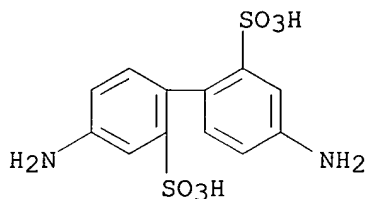
CMF C6 H15 N



CM 6

CRN 117-61-3

CMF C12 H12 N2 O6 S2



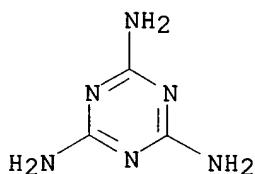
IT 108-78-1, Melamine, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

RN 108-78-1 HCAPLUS

CN 1,3,5-Triazine-2,4,6-triamine (9CI) (CA INDEX NAME)



RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 4 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:415005 HCAPLUS

DN 141:126239

TI Proton Conductive Polyimide **Electrolytes** Containing **Trifluoromethyl** Groups: Synthesis, Properties, and DMFC Performance

AU Miyatake, Kenji; Zhou, Hua; Matsuo, Takashi; Uchida, Hiroyuki; Watanabe, Masahiro

CS Clean Energy Research Center, University of Yamanashi, Kofu, 400-8510, Japan

SO Macromolecules (2004), 37(13), 4961-4966

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society
 DT Journal
 LA English

AB Sulfonated polyimide copolymers (FSPIH-X; X refers to molar percentage of bis(**trifluoromethyl**)biphenylene content) with X from 0 to 60 mol % were synthesized, of which **electrolyte** properties were studied and compared to those of the **perfluorinated** ionomer (Nafion 112). FSPIH-X **membranes** are thermally stable with no glass transition temperature observed below the decomposition temperature (280°).

Oxidative

stability of the **membranes** is improved with an increase in the content of **trifluoromethyl** substituents in the copolymer structure. FSPIH-60 endured for >9 h in Fenton's reagent at 80°. Bis(**trifluoromethyl**)biphenylene groups with the mol. size of 6.1 Å make each **polymer** chain sep. and produce space to hold water mols. despite their hydrophobic property so that the maximum water uptake was observed for FSPIH-20. Unlike the fluorene groups containing polyimides (SPIH-X), a strong water confinement effect was not obtained for FSPIH-X. The optimum composition of bis(**trifluoromethyl**)biphenylene groups was 30 mol %, and the FSPIH-30 **membrane** showed higher proton conductivity than 0.2 S cm⁻¹ at 30-140°. A direct methanol fuel cell (DMFC) using FSPIH-30 **membrane** revealed that the methanol crossover through the **membrane** equivalent to the c.d. of methanol oxidation at cathode (j(MeOH)) is 64 mA/cm² and merely 30% of that of Nafion 112 at open-circuit potential. A terminal voltage of 0.38 V was obtained at 200 mA/cm² by the operation at 80 and 90° with supplying dry and humidified oxygen.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 35, 38, 72, 76

ST proton conductive arom polyimide polyelectrolyte **trifluoromethyl** group; methanol fuel cell separator ionic cond methanol crossover modulus
 IT Polyimides, uses

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (aromatic, **fluorine**-containing, **trifluoromethyl**-, sulfonate-containing; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT Polyoxyalkylenes, uses

RL: DEV (Device component use); USES (Uses)
 (**fluorine**- and sulfo-containing, ionomers, electrode binder; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT Current density

(from methanol crossover, voltage and humidity effect on; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT Electric current-potential relationship

(of assembled fuel cell; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT Stability

(oxidative; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)

IT Carbon fibers, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

- (paper, anode support; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT **Fluoropolymers**, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (polyimide-, aromatic, **trifluoromethyl**-, sulfonate-containing; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT **Fluoropolymers**, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (polyimide-, **trifluoromethyl** group-containing, aryl, sulfonate-containing; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT **Fluoropolymers**, uses
 RL: DEV (Device component use); USES (Uses)
 (polyoxyalkylene-, sulfo-containing, ionomers, electrode binder; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Ionomers
 RL: DEV (Device component use); USES (Uses)
 (polyoxyalkylenes, **fluorine**- and sulfo-containing, electrode binder; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Ion exchange **membranes**
 (preparation and ion exchange capacity of; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Ionic conductivity
 (proton; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Fuel cell separators
 Fuel cells
 Membrane electrodes
 Membranes, nonbiological
 Polyelectrolytes
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Carbon black, uses
 RL: DEV (Device component use); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT **Fluoropolymers**, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT Polyimides, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (**trifluoromethyl** group-containing, aryl, sulfonate-containing;

- synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 7732-18-5, Water, processes
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
 (absorption of; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 7720-78-7, Ferrous sulfate
 RL: CAT (Catalyst use); USES (Uses)
 (for oxidative stability; synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 42615-02-1
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 67-56-1, Methanol, uses
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 7440-06-4, Platinum, uses 7440-57-5, Gold, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 108-39-4, m-Cresol, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 724457-50-5P 724457-51-6P 724457-52-7P
 RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 163294-14-2, Nafion 112
 RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 117-61-3P, 4,4'-Diamino-2,2'-biphenyldisulfonic acid 341-58-2P, 2,2'-Bis(**trifluoromethyl**)benzidine
 RL: PUR (Purification or recovery); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (synthesis, properties, and DMFC performance of proton conductive polyimide **electrolytes** containing **trifluoromethyl** groups)
- IT 65-85-0, Benzoic acid, reactions 81-30-1, 1,4,5,8-Naphthalenetetracarboxylic dianhydride 108-45-2, m-Phenylenediamine, reactions 108-78-1, Melamine, reactions 121-44-8,

Triethylamine, reactions 7722-84-1, Hydrogen peroxide, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (synthesis, properties, and DMFC performance of proton conductive
 polyimide **electrolytes** containing **trifluoromethyl**
 groups)

IT **724457-51-6P**

RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic
 preparation); PREP (Preparation)
 (synthesis, properties, and DMFC performance of proton conductive
 polyimide **electrolytes** containing **trifluoromethyl**
 groups)

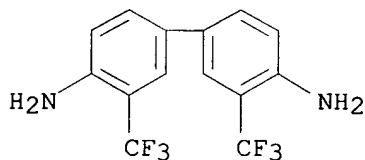
RN 724457-51-6 HCAPLUS

CN [1,1'-Biphenyl]-2,2'-disulfonic acid, 4,4'-diamino-, compd. with
 N,N-diethylethanamine (1:2), polymer with 1,3-benzenediamine,
 [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone,
 3,3'-bis(trifluoromethyl)[1,1'-biphenyl]-4,4'-diamine and
 1,3,5-triazine-2,4,6-triamine (9CI) (CA INDEX NAME)

CM 1

CRN 346-88-3

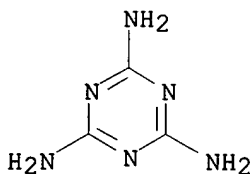
CMF C14 H10 F6 N2



CM 2

CRN 108-78-1

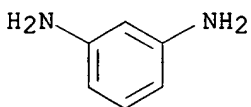
CMF C3 H6 N6



CM 3

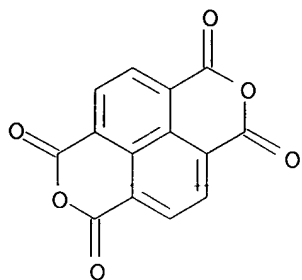
CRN 108-45-2

CMF C6 H8 N2



CM 4

CRN 81-30-1
CMF C14 H4 O6

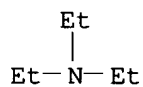


CM 5

CRN 481001-36-9
CMF C12 H12 N2 O6 S2 . 2 C6 H15 N

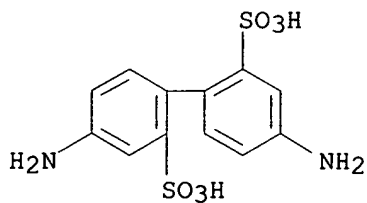
CM 6

CRN 121-44-8
CMF C6 H15 N



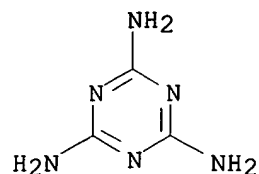
CM 7

CRN 117-61-3
CMF C12 H12 N2 O6 S2



IT 108-78-1, Melamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(synthesis, properties, and DMFC performance of proton conductive
polyimide **electrolytes** containing **trifluoromethyl**
groups)
RN 108-78-1 HCAPLUS

CN 1,3,5-Triazine-2,4,6-triamine (9CI) (CA INDEX NAME)



RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 5 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:161244 HCAPLUS
DN 140:202430
TI Salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials
IN Armand, Michel; Michot, Christophe; Gauthier, Michel; Choquette, Yves
PA Hydro-Quebec, Can.; Centre National De La Recherche Scientifique (CNRS)
SO Eur. Pat. Appl., 33 pp.
CODEN: EPXXDW

DT Patent
LA French

FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1391952	A2	20040225	EP 2003-292436	19971230
	R: DE, FR, GB, IT				
	CA 2194127	AA	19980630	CA 1996-2194127	19961230
	CA 2199231	AA	19980905	CA 1997-2199231	19970305
	EP 850933	A1	19980701	EP 1997-403188	19971230
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	EP 889863	A2	19990113	EP 1997-951051	19971230
	EP 889863	B1	20030507		
	R: DE, FR, GB, IT				
	EP 890176	A1	19990113	EP 1997-951052	19971230
	EP 890176	B1	20010620		
	R: DE, FR, GB, IT				
	JP 2000508114	T2	20000627	JP 1998-529517	19971230
	JP 2000508346	T2	20000704	JP 1998-529516	19971230
	JP 2000508676	T2	20000711	JP 1998-529514	19971230
	JP 2000508677	T2	20000711	JP 1998-529515	19971230
	JP 2000508678	T2	20000711	JP 1998-529518	19971230
	JP 2002514245	T2	20020514	JP 1998-529513	19971230
	US 6120696	A	20000919	US 1998-125792	19980828
	US 6171522	B1	20010109	US 1998-101811	19981119
	US 6333425	B1	20011225	US 1998-101810	19981119
	US 6228942	B1	20010508	US 1998-125798	19981202
	US 6395367	B1	20020528	US 1998-125799	19981202
	US 6319428	B1	20011120	US 1998-125797	19981203
	US 6365068	B1	20020402	US 2000-609362	20000630
	US 6576159	B1	20030610	US 2000-638793	20000809
	US 2001024749	A1	20010927	US 2001-826941	20010406
	US 6506517	B2	20030114		
	US 2002009650	A1	20020124	US 2001-858439	20010516
	US 2002102380	A1	20020801	US 2002-107742	20020327

	US 6835495	B2	20041228		
	US 2003052310	A1	20030320	US 2002-253035	20020924
	US 2003066988	A1	20030410	US 2002-253970	20020924
PRAI	CA 1996-2194127	A	19961230		
	CA 1997-2199231	A	19970305		
	EP 1997-403188	A3	19971230		
	WO 1997-CA1008	W	19971230		
	WO 1997-CA1009	W	19971230		
	WO 1997-CA1010	W	19971230		
	WO 1997-CA1011	W	19971230		
	WO 1997-CA1012	W	19971230		
	WO 1997-CA1013	W	19971230		
	US 1998-101810	A3	19981119		
	US 1998-101811	A3	19981119		
	US 1998-125798	A3	19981202		
	US 1998-125799	A3	19981202		
	US 1998-125797	A1	19981203		
	US 2000-638793	A1	20000809		
	US 2001-858439	A1	20010516		
AB	This invention describes ionic compds. where the anionic charge is delocalized. One compound of the invention contains an anionic part associated with at least one mono- or multivalent cationic part M ^{m+} , in a number sufficient to ensure electronic neutrality of the material. M can be a hydronium, nitrosyl NO ⁺ , an ammonium NH ₄ ⁺ , a metallic cation with valence m, an organic cation having a valence m, or an organometallic cation having valence m. The anionic charge is carried by a new pentacyclic moiety or derivative of tetrapentalene carrying electroattractive substituents. The compds. are used notably for ionic conduction, electronic conductors, dyes and colorants, and catalysts for diverse chemical reactions. They can also be used as electrolytes in fuel cells and batteries.				
IC	ICM H01M006-16 ICS H01M010-40				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 27, 28, 29, 35 , 76				
ST	pentacyclic tetrapentalene salt charge delocalized anion ionic conduction; alkali alk earth transition metal salt heterocyclic electrolyte polymer ; electrochem cell fuel polyelectrolyte cond soly catalysis fluoropolymer polysiloxane				
IT	Polymerization (anionic; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)				
IT	Polymers, uses RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses) (block, ethylene oxide, propylene oxide, allyl glycidyl ether; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)				
IT	Optical absorption (by polymer electrolytes ; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)				
IT	Carbon black, uses RL: DEV (Device component use); PRP (Properties); USES (Uses) (composite electrodes with soft polymer or LiCoO ₂ and polymer gel electrolytes , or with acetylene black, VO ₂ and PEO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)				
IT	Polyoxyalkylenes, processes RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP				

- (Physical process); PROC (Process)
 (**electrolyte** complexes with lithium salts, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Polysiloxanes, uses
 RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (**fluorine**-containing, reaction products; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Polysiloxanes, uses
 RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
 (**fluorine**-containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Textiles
 (laminated, polyelectrolyte composite **membrane** **perfluorinated** sulfonylpyrazole-containing **polymer**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Open circuit potential
 (of dye-sensitized solar cells with imidazolium-triazole-iodide **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Ionic conductivity
 (of lithium salts in **polymer electrolytes** and **polymer gel electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Cyclic voltammetry
 (of secondary battery cells with **polymer gel electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **Fluorides**, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (organic; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Azines
 Group VA element compounds
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (phosphazines, **polymers**, "solvents" for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Polar solvents
 (**polymeric**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Vinyl compounds, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (**polymers**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **Fluoropolymers**, uses
 RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)

- (polysiloxane-; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT Aldol condensation catalysts
- Antistatic agents
- Coloring materials
- Corrosion inhibitors
- Dyes
- Electron delocalization
- Esterification
- Friedel-Crafts reaction catalysts
- Fuel cell separators
- Heterojunction solar cells
- Ionic liquids
- Michael reaction catalysts
- Plasticizers**
- Polyelectrolytes
- Polymer electrolytes**
- Polymerization catalysts**
- Solubility
- Substitution reaction, nucleophilic
- Surfactants
 - (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **Fluoropolymers**, uses
 - Polyanilines
 - Salts, uses
 - RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 - (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **Fluoropolymers**, uses
 - RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 - (siloxane-, reaction products; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **661461-43-4P**
 - RL: CAT (Catalyst use); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 - (Aldol condensation catalyst; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **661467-43-2P**
 - RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 - (an antistatic surfactant; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **210469-97-9P**
 - RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 - (composite electrodes with LiCoO₂ and carbon black; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 25322-68-3, Polyethylene oxide
 - RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
 - (**electrolyte** complexes with lithium salts, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 210289-62-6P

- RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(**electrolyte**, ionic liquid; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **210470-02-3P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(electropolymer; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
RL: PRP (Properties)
(in gel **polymer electrolyte**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 107-13-1, **Acrylonitrile**, reactions
RL: PRP (Properties); **RCT (Reactant)**; RACT (Reactant or reagent)
(in gel **polymer electrolyte**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **661461-63-8P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(photoinitiator; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **210289-59-1P**
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(polyelectrolyte composite **membrane** with GoreTex and Friedel-Crafts catalyst; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 661461-54-7P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(pure and **polymer electrolytes** with polyethylene oxide; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 210289-36-4P 661461-40-1P **661461-42-3P** 661461-49-0P
661461-50-3P 661461-64-9P 661467-44-3P
RL: DEV (Device component use); PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 554-68-7, Triethylammonium chloride **2624-17-1**, Sodium isocyanurate 4128-37-4 7492-68-4, Copper carbonate 7727-37-9, Nitrogen, processes 14075-53-7, Potassium **tetrafluoroborate** 63872-66-2, 1,4-Diazabicyclo[2.2.2]octane, hydrochloride
RL: FMU (Formation, unclassified); REM (Removal or disposal); FORM (Formation, nonpreparative); PROC (Process)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 75-38-7D, Vinylidene **difluoride**, derivs., **polymers** of 80-62-6D, Methyl methacrylate, derivs., **polymers** of 88-12-0D, derivs., **polymers** of 107-13-1D, Acrylonitrile, derivs., **polymers** of
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT **210289-57-9P**
RL: PEP (Physical, engineering or chemical process); PUR (Purification or

recovery); PYP (Physical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210469-91-3P 661461-52-5P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210470-01-2P

RL: PUR (Purification or recovery); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 709-62-6P 7343-34-2P, 3,5-Dimethyl-1H-1,2,4-triazole 25979-00-4P
210289-29-5P 210289-38-6P 210289-49-9P 210289-52-4P
210469-88-8P 210469-95-7P 661461-45-6P 661461-57-0P
661461-60-5P

RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 100-06-1P, p-Acetylanisole 210289-48-8P 661461-44-5P
661461-53-6P 661461-55-8P 661461-56-9P 661467-37-4P

RL: PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 76-05-1, reactions 78-94-4, Methyl vinyl ketone, reactions 94-41-7
98-88-4, Benzoyl chloride 100-52-7, Benzaldehyde, reactions 100-66-3,
Anisole, reactions 102-52-3, 1,1,3,3-Tetramethoxypropane 106-20-7,
Di-2-ethylhexylamine 108-24-7, Acetic anhydride 109-72-8,
Butyllithium, reactions 110-61-2, Succinic dinitrile
112-76-5, Stearic acid chloride 121-44-8, Triethylamine, reactions
143-33-9, Sodium cyanide 144-55-8, Sodium bicarbonate, reactions
303-04-8, 2,3-Dichloro-Hexafluoro-2-butene 326-90-9, 4,4,4-
Trifluoro-1-(2-furyl)-1,3-butanedione 326-91-0 375-72-4
, Perfluorobutanesulfonyl fluoride 407-38-5, 2,2,2-
Trifluoroethyl trifluoroacetate 421-83-0,
Trifluoromethanesulfonyl chloride 497-19-8, Sodium carbonate,
reactions 538-75-0, Dicyclohexylcarbodiimide 542-92-7,
Cyclopentadiene, reactions 554-13-2, Lithium carbonate 584-08-7,
Potassium carbonate 676-58-4, Methylmagnesium chloride 677-25-8
, Ethenesulfonyl fluoride 692-50-2 693-13-0,
1,3-Diisopropylcarbodiimide 764-93-2, 1-Decyne 765-12-8, Triethylene
glycol divinyl ether 917-70-4, Lanthanum acetate 937-14-4,
3-Chloroperoxybenzoic acid 1000-84-6 1068-57-1, Acetylhydrazide
1122-28-7, 4,5-Dicyanoimidazole 1310-58-3, Potassium hydroxide,
reactions 1522-22-1, Hexafluoroacetylacetone 1643-19-2,
Tetrabutylammonium bromide 1648-99-3 2094-98-6, 1,1'-Azobis(
cyclohexanecarbonitrile) 2582-30-1, 1-Aminoguanidine bicarbonate
2633-67-2, 4-Styrenesulfonyl chloride 2638-94-0, 4,4'-Azobis(4-
cyanovaleric acid) 2893-78-9, Dichloroisocyanuric acid, sodium salt
3804-23-7, Scandium acetate 4546-95-6, 1,2,3-Triazole-4,5-dicarboxylic
acid 7447-41-8, Lithium chloride, reactions 7647-01-0, Hydrochloric
acid, reactions 7647-14-5, Sodium chloride, reactions 7664-39-3,
Hydrofluoric acid, reactions 7757-82-6, Sodium sulfate,
reactions 7758-09-0, Potassium nitrite 7782-50-5, Chlorine, reactions
7789-23-3, Potassium fluoride 9002-92-0, Brij 30 13360-57-1

13637-84-8, Chlorosulfonyl **fluoride** 13781-67-4,
 2-(3-Thienyl)ethanol 14635-75-7, Nitrosonium **tetrafluoroborate**
16090-14-5 17455-13-9, 18-Crown-6 17587-22-3, 1,1,1,2,2,3,3-
Heptafluoro-7,7-dimethyl-4,6-octanedione 20583-66-8,
 1,1,1,5,5,6,6,7,7,7-**Decafluoro**-2,4-Heptanedione 26628-22-8,
 Sodium azide 27070-49-1, 1,2,3-Triazole 31469-15-5,
 1-Methoxy-1-(trimethylsilyloxy)-2-methyl-1-propene 39262-22-1
 39377-49-6, Copper cyanide 53188-07-1, Trolox 56512-49-3,
 4-(Dimethylamino)azobenzene-4'-sulfonyl chloride 65039-09-0,
 1-Ethyl-3-methyl-1H-imidazolium chloride 66051-48-7 77968-17-3
 81850-46-6 81850-47-7 89183-45-9, Polyaniline hydrochloride
 210049-00-6 210289-26-2 210289-55-7 210469-93-5 **661461-58-1**
 661461-61-6

RL: **RCT (Reactant)**; RACT (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses
 as ionic conductive materials)

IT 7081-78-9P, 1-Chloro-1-ethoxyethane 14694-34-9P 210289-23-9P
 210289-24-0P 210289-27-3P 210289-28-4P 210289-33-1P 210289-34-2P
 210289-35-3P **210469-96-8P** **210470-00-1P** 661461-47-8P
 661461-59-2P 661467-33-0P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses
 as ionic conductive materials)

IT 58649-05-1P 107740-92-1P 159699-92-0P 210289-25-1P 210469-94-6P
 661461-39-8P 661461-41-2P **661461-46-7P** 661461-48-9P
 661465-23-2P 661467-34-1P 661467-35-2P 661467-36-3P 661467-38-5P
 661467-39-6DP, tetraalkylammonium salts

RL: SPN (Synthetic preparation); PREP (Preparation)

(salts of pentacyclic or tetrapentalene derived anions, and their uses
 as ionic conductive materials)

IT 156118-35-3DP, 2-(5-cyano-1,3,4-triazole)-4,4-**difluorobutyl**-,
 lithium salt

RL: PUR (Purification or recovery); SPN (Synthetic preparation); PREP
 (Preparation)

(surfactant and antistatic; salts of pentacyclic or tetrapentalene
 derived anions, and their uses as ionic conductive materials)

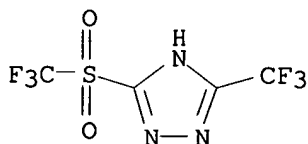
IT **661461-43-4P**

RL: CAT (Catalyst use); PUR (Purification or recovery); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)

(Aldol condensation catalyst; salts of pentacyclic or tetrapentalene
 derived anions, and their uses as ionic conductive materials)

RN 661461-43-4 HCAPLUS

CN 1H-1,2,4-Triazole, 3-(trifluoromethyl)-5-[(trifluoromethyl)sulfonyl]-,
 scandium(3+) salt (9CI) (CA INDEX NAME)



● 1/3 Sc(III)

IT **661467-43-2P**

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(an antistatic surfactant; salts of pentacyclic or tetrapentalene
derived anions, and their uses as ionic conductive materials)

RN 661467-43-2 HCAPLUS

CN Phenothiazin-5-ium, 3,7-bis(dimethylamino)-, salt with
4-[(4-ethenylphenyl)sulfonyl]-3,5-bis(trifluoromethyl)-1,3-cyclopentadiene-
1,2-dicarbonitrile (1:1), polymer with 2-propenenitrile (9CI) (CA INDEX
NAME)

CM 1

CRN 107-13-1

CMF C3 H3 N



CM 2

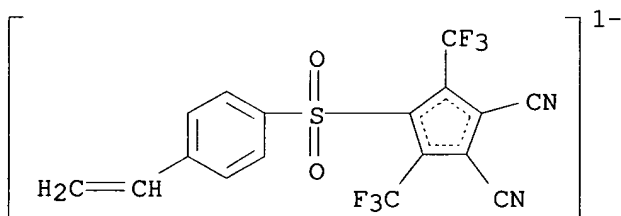
CRN 661467-42-1

CMF C17 H7 F6 N2 O2 S . C16 H18 N3 S

CM 3

CRN 661467-41-0

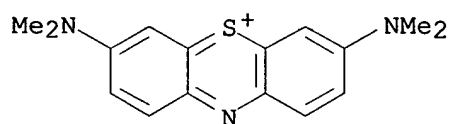
CMF C17 H7 F6 N2 O2 S



CM 4

CRN 7060-82-4

CMF C16 H18 N3 S



IT 210469-97-9P

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
preparation); PREP (Preparation); USES (Uses)
(composite electrodes with LiCoO2 and carbon black; salts of
pentacyclic or tetrapentalene derived anions, and their uses as ionic

conductive materials)

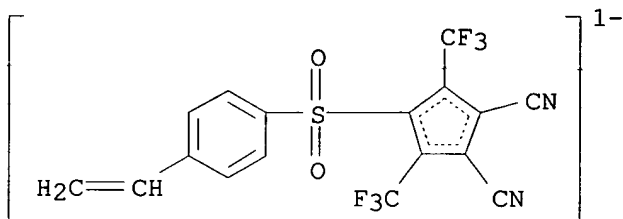
RN 210469-97-9 HCAPLUS

CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-[(4-ethenylphenyl)sulfonyl]-3,5-bis(trifluoromethyl)-, ion(1-), lithium, polymer with 2-propenenitrile (9CI) (CA INDEX NAME)

CM 1

CRN 210469-96-8

CMF C17 H7 F6 N2 O2 S . Li



● Li⁺

CM 2

CRN 107-13-1

CMF C3 H3 N



IT 210470-02-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(electropolymd.; salts of pentacyclic or tetrapentalene derived anions,
and their uses as ionic conductive materials)

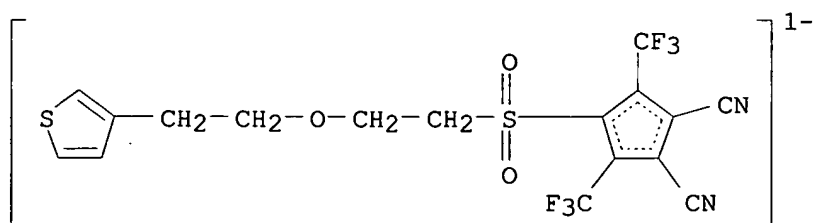
RN 210470-02-3 HCAPLUS

CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-[[2-[2-(3-thienyl)ethoxy]ethyl]sulfonyl]-3,5-bis(trifluoromethyl)-, ion(1-), potassium, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 210470-01-2

CMF C17 H11 F6 N2 O3 S2 . K



● K⁺

IT **661461-63-8P**

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(photoinitiator; salts of pentacyclic or tetrapentalene derived anions,
and their uses as ionic conductive materials)

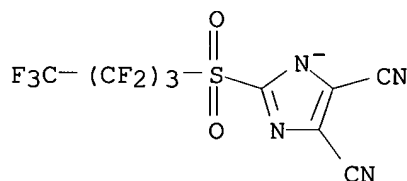
RN 661461-63-8 HCAPLUS

CN Iodonium, didodecyl-, salt with 2-[(nonafluorobutyl)sulfonyl]-1H-imidazole-
4,5-dicarbonitrile (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 661461-62-7

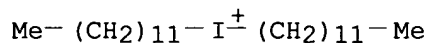
CMF C9 F9 N4 O2 S



CM 2

CRN 77355-27-2

CMF C24 H50 I



IT **210289-59-1P**

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
preparation); PREP (Preparation); USES (Uses)
(polyelectrolyte composite **membrane** with GoreTex and
Friedel-Crafts catalyst; salts of pentacyclic or tetrapentalene derived
anions, and their uses as ionic conductive materials)

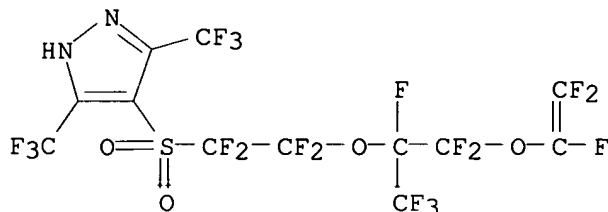
RN 210289-59-1 HCAPLUS

CN 1H-Pyrazole, 4-[[2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-
tetrafluoroethoxy]-1,1,2,2-tetrafluoroethyl]sulfonyl]-3,5-

bis(trifluoromethyl)-, potassium salt, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 210289-57-9

CMF C12 H F19 N2 O4 S . K

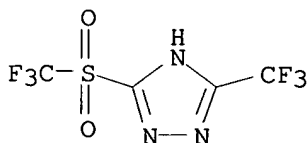
● K

IT 661461-42-3P

RL: DEV (Device component use); PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation); USES (Uses (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials))

RN 661461-42-3 HCAPLUS

CN 1H-1,2,4-Triazole, 3-(trifluoromethyl)-5-[(trifluoromethyl)sulfonyl]-,
lithium salt (9CI) (CA INDEX NAME)



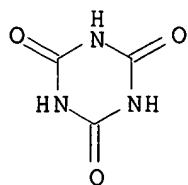
● Li

IT 2624-17-1, Sodium isocyanurate

RL: FMU (Formation, unclassified); REM (Removal or disposal); FORM (Formation, nonpreparative); PROC (Process)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

RN 2624-17-1 HCAPLUS

CN 1,3,5-Triazine-2,4,6(1H,3H,5H)-trione, monosodium salt (9CI) (CA INDEX NAME)



● Na

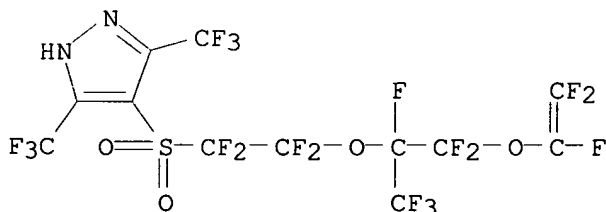
IT 210289-57-9P

RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

RN 210289-57-9 HCAPLUS

CN 1H-Pyrazole, 4-[[2-[1-[difluoro[(trifluoroethenyl)oxy)methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoroethyl)sulfonyl]-3,5-bis(trifluoromethyl)-, potassium salt (9CI) (CA INDEX NAME)



● K

IT 210469-91-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

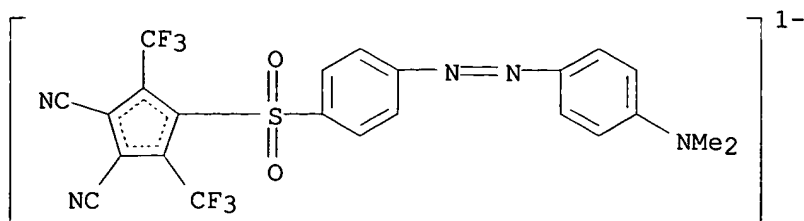
RN 210469-91-3 HCAPLUS

CN 1-Butanaminium, N,N,N-tributyl-, salt with 4-[[4-[[4-(dimethylamino)phenyl]azo]phenyl]sulfonyl]-3,5-bis(trifluoromethyl)-1,3-cyclopentadiene-1,2-dicarbonitrile (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 210469-90-2

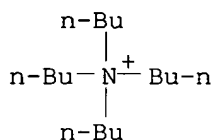
CMF C23 H14 F6 N5 O2 S



CM 2

CRN 10549-76-5

CMF C16 H36 N



IT 210470-01-2P

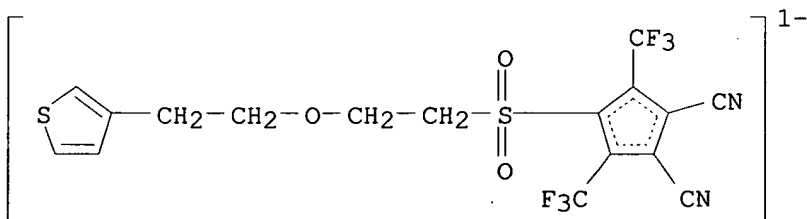
RL: PUR (Purification or recovery); RCT (Reactant); PREP (Preparation);

RACT (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

RN 210470-01-2 HCAPLUS

CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-[[2-[2-(3-thienyl)ethoxy]ethyl]sulfonyl]-3,5-bis(trifluoromethyl)-, ion(1-), potassium (9CI) (CA INDEX NAME)



● K⁺

IT 210289-29-5P 661461-45-6P

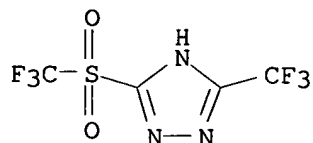
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic

preparation); PREP (Preparation); RACT (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

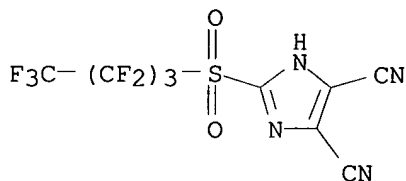
RN 210289-29-5 HCAPLUS

CN 1H-1,2,4-Triazole, 3-(trifluoromethyl)-5-[(trifluoromethyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)



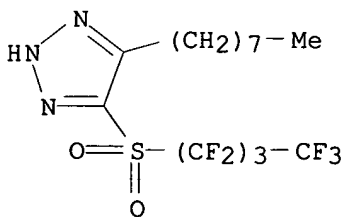
● K

RN 661461-45-6 HCAPLUS
 CN 1H-Imidazole-4,5-dicarbonitrile, 2-[(nonafluorobutyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)



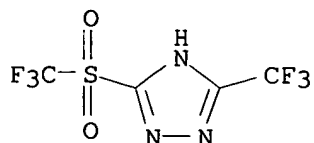
● K

IT 210289-48-8P 661461-44-5P 661461-55-8P
 661461-56-9P
 RL: PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
 (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
 RN 210289-48-8 HCAPLUS
 CN 2H-1,2,3-Triazole, 4-[(nonafluorobutyl)sulfonyl]-5-octyl-, lithium salt (9CI) (CA INDEX NAME)



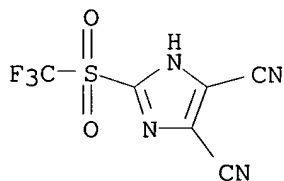
● Li

RN 661461-44-5 HCAPLUS
 CN 1H-1,2,4-Triazole, 3-(trifluoromethyl)-5-[(trifluoromethyl)sulfonyl]-, lanthanum(3+) salt (9CI) (CA INDEX NAME)



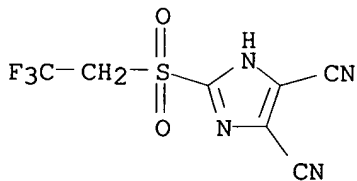
● 1/3 La(III)

RN 661461-55-8 HCAPLUS
 CN 1H-Imidazole-4,5-dicarbonitrile, 2-[(trifluoromethyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)



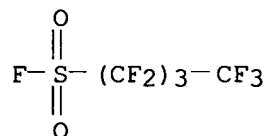
● K

RN 661461-56-9 HCAPLUS
 CN 1H-Imidazole-4,5-dicarbonitrile, 2-[(2,2,2-trifluoroethyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)

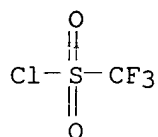


● K

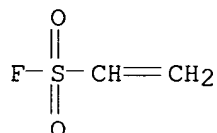
IT 375-72-4, Perfluorobutanesulfonyl fluoride
 421-83-0, Trifluoromethanesulfonyl chloride
 677-25-8, Ethenesulfonyl fluoride 1648-99-3
 16090-14-5 661461-58-1
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (salts of pentacyclic or tetrapentalene derived anions, and their uses
 as ionic conductive materials)
 RN 375-72-4 HCAPLUS
 CN 1-Butanesulfonyl fluoride, 1,1,2,2,3,3,4,4,4-nonafluoro- (8CI, 9CI) (CA
 INDEX NAME)



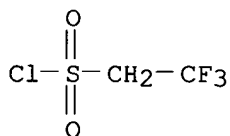
RN 421-83-0 HCAPLUS
CN Methanesulfonyl chloride, trifluoro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



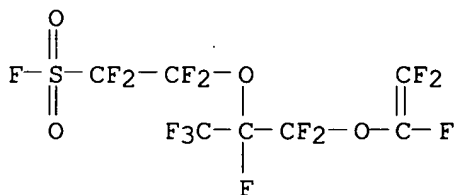
RN 677-25-8 HCAPLUS
CN Ethenesulfonyl fluoride (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



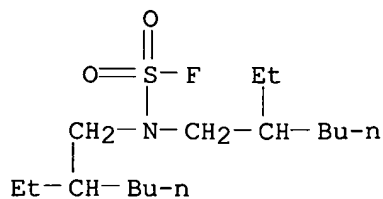
RN 1648-99-3 HCAPLUS
CN Ethanesulfonyl chloride, 2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 16090-14-5 HCAPLUS
CN Ethanesulfonyl fluoride, 2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



RN 661461-58-1 HCAPLUS
CN 1-Hexanamine, 2-ethyl-N-(2-ethylhexyl)-N-(fluorosulfonyl)- (9CI) (CA INDEX NAME)



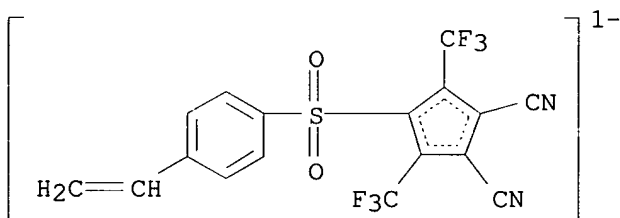
IT 210469-96-8P 210470-00-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

RN 210469-96-8 HCAPLUS

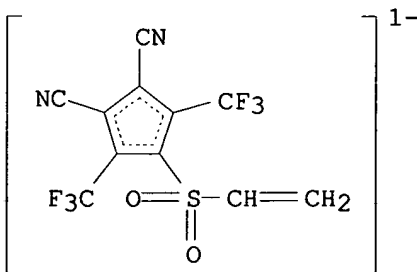
CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-[(4-ethenylphenyl)sulfonyl]-3,5-bis(trifluoromethyl)-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

RN 210470-00-1 HCAPLUS

CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-(ethenylsulfonyl)-3,5-bis(trifluoromethyl)-, ion(1-), potassium (9CI) (CA INDEX NAME)



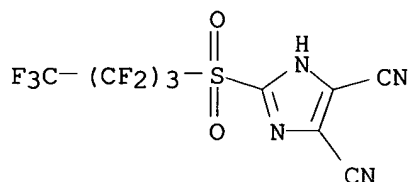
● K⁺

IT 661461-46-7P

RL: SPN (Synthetic preparation); PREP (Preparation)
(salts of pentacyclic or tetrapentalene derived anions, and their uses
as ionic conductive materials)

RN 661461-46-7 HCAPLUS

CN 1H-Imidazole-4,5-dicarbonitrile, 2-[(nonafluorobutyl)sulfonyl]-, lithium
salt (9CI) (CA INDEX NAME)



● Li

L51 ANSWER 6 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:142660 HCAPLUS

DN 140:166814

TI A separator for **polymer electrolyte membrane**
fuel cell

IN Yoon, Jong-Jin; Lim, Il-Ji; Saitoh, Akihisa

PA S. Korea

SO U.S. Pat. Appl. Publ., 7 pp.

CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004033413	A1	20040219	US 2003-643647	20030818
	JP 2004079536	A2	20040311	JP 2003-293406	20030814
PRAI	KR 2002-48357	A	20020816		

AB The present invention provides a separator for a **polymer electrolyte membrane** fuel cell which comprises a resin substrate and an electroconductive coating formed on the substrate. The resin substrate is thermoplastic or thermosetting resin.

IC ICM H01M008-02

ICS H01M008-10; B32B027-34; B32B027-08; B32B027-36; B32B027-00

NCL 429034000; 429030000; 428412000; 428473500; 428474400

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): **38**

ST separator **polymer electrolyte membrane** fuel
cell

IT Acrylic **polymers**, uses

Epoxy resins, uses

Phenols, uses

Polysiloxanes, uses

RL: MOA (Modifier or additive use); USES (Uses)

(binder; separator for **polymer electrolyte membrane** fuel cell)

IT Synthetic fibers

RL: MOA (Modifier or additive use); USES (Uses)

(boron; separator for **polymer electrolyte membrane** fuel cell)

IT Coating materials
(elec. conductive; separator for **polymer electrolyte membrane** fuel cell)

IT Phenolic resins, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(novolak; separator for **polymer electrolyte membrane** fuel cell)

IT Metals, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(powder; separator for **polymer electrolyte membrane** fuel cell)

IT Cellulose pulp
Electric conductivity
Fuel cell separators
Paper
(separator for **polymer electrolyte membrane** fuel cell)

IT Polyamides, uses
Polycarbonates, uses
Polyimides, uses
Polyoxymethylenes, uses
Polysulfides
RL: DEV (Device component use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Asbestos
RL: MOA (Modifier or additive use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Carbon black, uses
RL: MOA (Modifier or additive use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Carbon fibers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Clays, uses
RL: MOA (Modifier or additive use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Glass fibers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Metallic fibers
RL: MOA (Modifier or additive use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Zeolites (synthetic), uses
RL: MOA (Modifier or additive use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Aminoplasts
RL: TEM (Technical or engineered material use); USES (Uses)
(separator for **polymer electrolyte membrane** fuel cell)

IT Fuel cells
 (solid **electrolyte**, direct methanol; separator for
polymer electrolyte membrane fuel cell)

IT Coating process
 (spray; separator for **polymer electrolyte**
membrane fuel cell)

IT Polythiophenylenes
 RL: TEM (Technical or engineered material use); USES (Uses)
 (substrate; separator for **polymer electrolyte**
membrane fuel cell)

IT Synthetic **polymeric** fibers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (**tetrafluoroethylene**; separator for **polymer**
electrolyte membrane fuel cell)

IT **Plastics**, uses
 RL: DEV (Device component use); USES (Uses)
 (thermoplastics; separator for **polymer electrolyte**
membrane fuel cell)

IT **Plastics**, uses
 RL: DEV (Device component use); USES (Uses)
 (thermosetting; separator for **polymer electrolyte**
membrane fuel cell)

IT 7440-44-0, Carbon, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (elec. conductive; separator for **polymer electrolyte**
membrane fuel cell)

IT 9003-56-9
 RL: DEV (Device component use); USES (Uses)
 (separator for **polymer electrolyte membrane**
 fuel cell)

IT 7631-86-9, Silica, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (separator for **polymer electrolyte membrane**
 fuel cell)

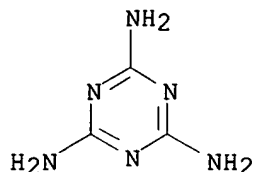
IT 67-56-1, Methanol, uses **9003-08-1**, Melamine resin 25212-74-2,
 Ryton PR 26 56645-29-5, Tenac 654671-99-5, DS 0916AT 654672-10-3,
 Penolite KC 3020 654672-18-1, DS 7260THM 654672-30-7, CEL 400
 655233-24-2, DS 7250TH
 RL: TEM (Technical or engineered material use); USES (Uses)
 (separator for **polymer electrolyte membrane**
 fuel cell)

IT **9003-08-1**, Melamine resin
 RL: TEM (Technical or engineered material use); USES (Uses)
 (separator for **polymer electrolyte membrane**
 fuel cell)

RN 9003-08-1 HCAPLUS
 CN 1,3,5-Triazine-2,4,6-triamine, polymer with formaldehyde (9CI) (CA INDEX
 NAME)

CM 1

CRN 108-78-1
 CMF C3 H6 N6



CM 2

CRN 50-00-0

CMF C H2 O

H₂C=O

L51 ANSWER 7 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:21068 HCAPLUS

DN 140:79803

TI Fuel cell incorporating a **polymer electrolyte membrane** grafted by irradiation

IN Dubitsky, Yuri A.; Lopes Correia Tavares, Ana Berta; Zaopo, Antonio; Albizzati, Enrico

PA Pirelli & C. S.P.A., Italy

SO PCT Int. Appl., 31 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004004053	A2	20040108	WO 2003-EP6580	20030623
	WO 2004004053	A3	20040325		
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	WO 2004051782	A1	20040617	WO 2002-EP7166	20020628

W: US

PRAI WO 2002-EP7166 A 20020628

AB The invention concerns a fuel cell comprising: (a) an anode; (b) a cathode; (c) a **polymer electrolyte membrane** placed between the anode and the cathode which comprises at least one polyolefin grafted with side chains containing proton conductive functional groups; wherein the fuel cell has: a value of cell resistance at 90° not higher than 0.30 Ω-cm², preferably comprised between 0.2 and 0.25 Ω-cm², more preferably comprised between 0.05 and 0.20 Ω-cm²; a value of cell resistance at 20° differing from the value of cell resistance at 90° of an amount not higher than 90%,

preferably not higher than 70%, more preferably not higher than 50%, with respect to the value of cell resistance at 90°. Preferably, the fuel cell is a direct methanol fuel cell.

- IC ICM H01M008-10
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST fuel cell **polymer electrolyte membrane**
irradn grafted; methanol direct fuel cell
- IT Permeation
(MeOH; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Sulfonation
(agents; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Hydrocarbons, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(cyclic, solvent; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(**fluorine-** and sulfo-containing, ionomers; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Decomposition catalysts
Electric vehicles
Fuel cell **electrolytes**
(fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Cyclic compounds
RL: TEM (Technical or engineered material use); USES (Uses)
(hydrocarbons, solvent; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Gamma ray
Plasma
UV radiation
X-ray
(irradiation; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT **Fluoropolymers**, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, **fluorine-** and sulfo-containing; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT EPDM rubber
Fluoropolymers, uses
Polyolefins
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(proton-conductive functional group-containing side chain-grafted; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)
- IT Fuel cells
(solid **electrolyte, polymer electrolyte membrane**, direct methanol; fuel cell incorporating

polymer electrolyte membrane grafted by irradiation)

IT Alcohols, uses
Aromatic hydrocarbons, uses
Esters, uses
Ethers, uses
Ketones, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(solvent; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT Hydrocarbons, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(unsatd.; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT Sulfonic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(vinylalkyl; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT 1344-67-8, Copper chloride 7720-78-7, Ferrous sulfate 10025-73-7, Chromic chloride 10045-89-3, Ferrous ammonium sulfate 10241-04-0, Cobaltic chloride
RL: CAT (Catalyst use); USES (Uses)
(fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT 79-10-7, Acrylic acid, processes 79-41-4, Methacrylic acid, processes 98-83-9, α -Methylstyrene, processes 100-42-5, Styrene, processes 100-42-5D, Styrene, chloroalkyl derivative 100-80-1, m-Methylstyrene 101-37-1, Triallyl cyanurate 611-15-4, O-Methylstyrene 622-97-9, p-Methylstyrene 696-31-1, α - **Fluorostyrene** 769-57-3, α,β,β -Trimethylstyrene 1321-74-0, Divinylbenzene, processes 1337-81-1, Vinylpyridine 1592-20-7, p-Chloromethylstyrene 2082-61-3, α,β -Dimethylstyrene 7664-93-9, Sulfuric acid, processes 7789-21-1, **Fluorosulfonic acid** 7790-94-5, Chlorosulfonic acid 13537-32-1, **Fluorophosphoric acid** 13779-42-5, Chlorophosphoric acid 90622-00-7, Benzene, ethenyl-, **trifluoro** derivative
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT 66796-30-3, Nafion 117 163294-14-2, Nafion 112
RL: DEV (Device component use); USES (Uses)
(fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT 67-56-1, Methanol, uses 1333-74-0, Hydrogen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT 12587-47-2, Beta particle
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(irradiation; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT 9002-85-1, Polyvinylidene chloride 9002-86-2, Polyvinyl chloride 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9010-79-1, Ethylene-propylene copolymer 9011-17-0, **Hexafluoropropylene**-vinylidene **fluoride** copolymer 24937-78-8, Ethylene-vinyl

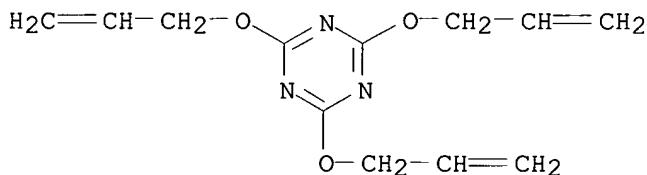
acetate copolymer 24937-79-9, PvdF 24981-14-4, Polyvinyl
fluoride 25101-39-7, **Chlorotrifluoroethylene**-propylene
copolymer 25684-76-8, **Tetrafluoroethylene**-vinylidene
fluoride copolymer 25750-84-9, Butyl acrylate-ethylene copolymer
26160-99-6, Ethylene-**Hexafluoropropylene** copolymer 52991-93-2,
Hexafluoropropylene-propylene copolymer
RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)

(proton-conductive functional group-containing side chain-grafted; fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

IT 101-37-1, Triallyl cyanurate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(fuel cell incorporating **polymer electrolyte membrane** grafted by irradiation)

RN 101-37-1 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(2-propenyloxy)- (9CI) (CA INDEX NAME)



L51 ANSWER 8 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:696948 HCAPLUS

DN 139:231403

TI Production of oligomers and **polymers** containing sulfinic groups

IN Kerres, Jochen; Haering, Thomas

PA Universität Stuttgart, Germany

SO PCT Int. Appl., 73 pp.

CODEN: PIXXD2

DT Patent

LA German

FAN.CNT 5

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003072641	A1	20030904	WO 2003-DE733	20030228
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			

DE 10261784	A1	20031106	DE 2002-10261784	20021223
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DE 10308462	A1	20031023	DE 2003-10308462	20030221
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PRAI DE 2002-10208679 A 20020228

DE 2002-10209786 A 20020228

DE 2002-10261784 A 20021223

AB In the title process, useful in the preparation of **membranes** or other

moldings, **polymers** or **polymer** blends bearing sulfinic groups, or their metal or ammonium salts, are subjected to S-alkylation. A 5% DMSO solution of polysulfone sulfinic Li salt was stirred (10 g) with 10.179 g 5% DMSO solution of (3-bromopropyl)trimethylammonium bromide, left for 48 h at 80°, cast on a glass plate, and the solvent was evaporated to give a film which was removed from the glass and treated with 10% NaOH at room temperature for 24 h and then with H₂O at 60° for 24 h.

- IC ICM C08J005-22
- ICS B01D071-68; H01M008-02; H01M008-10; C08G065-48; C08G075-23
- CC 37-3 (**Plastics** Manufacture and Processing)
- ST sulfinic **polymer** alkylation; polysulfone sulfinic alkylation; quaternary ammonium salt alkylation **polymer** sulfinic; film manuf **polymer** sulfinic alkylated; **membrane** manuf **polymer** sulfinic alkylated
- IT Polysulfones, uses
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (Radel R, sulfinated, alkylated derivs.; production of oligomers and **polymers** containing sulfinic groups)
- IT **Electrolytic** cells
 (membrane; production of oligomers and **polymers** containing sulfinic groups for electrolysis **membranes**)
- IT Ionomers
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (membranes; production of oligomers and **polymers** containing sulfinic groups)
- IT Polyketones
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (polyether-, sulfinated, alkylated derivs.; production of oligomers and **polymers** containing sulfinic groups)
- IT Polyethers, uses
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (polyketone-, sulfinated, alkylated derivs.; production of oligomers and **polymers** containing sulfinic groups)
- IT Sulfinic acids
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (polymeric, alkylated derivs.; production of oligomers and **polymers** containing sulfinic groups)
- IT Anion exchange **membranes**
 Cation exchange **membranes**
 (production of oligomers and **polymers** containing sulfinic groups)
- IT Quaternary ammonium compounds, uses
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (reaction products with sulfinated **polymers**; production of oligomers and **polymers** containing sulfinic groups)
- IT 17681-50-4D, C.I. 18105, reaction products with sulfinated **polymers**
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical

process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (Cibacron Brilliant Red; production of oligomers and **polymers** containing sulfinate groups)

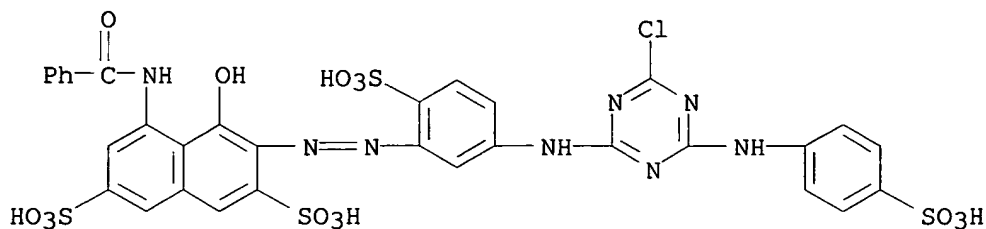
IT 50662-99-2D, C.I. 18972, reaction products with sulfinated **polymers**
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (Cibacron Brilliant Yellow; production of oligomers and **polymers** containing sulfinate groups)

IT 312-30-1D, Bis(4-**fluoro**-3-nitrophenyl) sulfone, reaction products with sulfinated **polymers** 349-88-2D, 4-**Fluorobenzenesulfonyl** chloride, reaction products with sulfinated **polymers** 383-29-9D, Bis(4-**fluorophenyl**) sulfone, reaction products with sulfinated **polymers** 628-21-7D, 1,4-Diiodobutane, reaction products with alkylated **polymer** sulfonates 832-53-1D, **Pentafluorobenzenesulfonyl** chloride, reaction products with sulfinated **polymers** 1622-32-8D, (2-Chloroethane)sulfonyl chloride, reaction products with sulfinated **polymers** 3607-17-8D, (3-Bromopropyl)triphenylphosphonium bromide, reaction products with sulfinated **polymers** 3779-42-8D, (3-Bromopropyl)trimethylammonium bromide, reaction products with sulfinated **polymers** 4263-52-9D, Sodium (2-bromoethyl)sulfonate, reaction products with sulfinated **polymers** 4857-04-9D, 2-(Chloromethyl)benzimidazole, reaction products with sulfonated **polymers** 5324-30-1D, Diethyl (2-bromoethyl)phosphonate, reaction products with sulfinated **polymers** 25135-51-7D, Udel, sulfinated, alkylated 54300-32-2D, Bis(4-**fluorophenyl**)phenylphosphine oxide, reaction products with sulfinated **polymers** 55120-75-7D, Calcium **trifluoromethanesulfonate**, reaction products with sulfinated **polymers** 60230-36-6D, 2,6-Difluorobenzenesulfonyl chloride, reaction products with sulfinated **polymers** 63051-08-1D, reaction products with sulfinated **polymers** 175278-08-7D, 2,3,4-Trifluorobenzenesulfonyl chloride, reaction products with sulfinated **polymers** 591249-21-7D, reaction products with sulfinated **polymers** 591249-22-8D, reaction products with sulfinated **polymers**
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (production of oligomers and **polymers** containing sulfinate groups)

IT 17681-50-4D, C.I. 18105, reaction products with sulfinated **polymers**
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (Cibacron Brilliant Red; production of oligomers and **polymers** containing sulfinate groups)

RN 17681-50-4 HCAPLUS

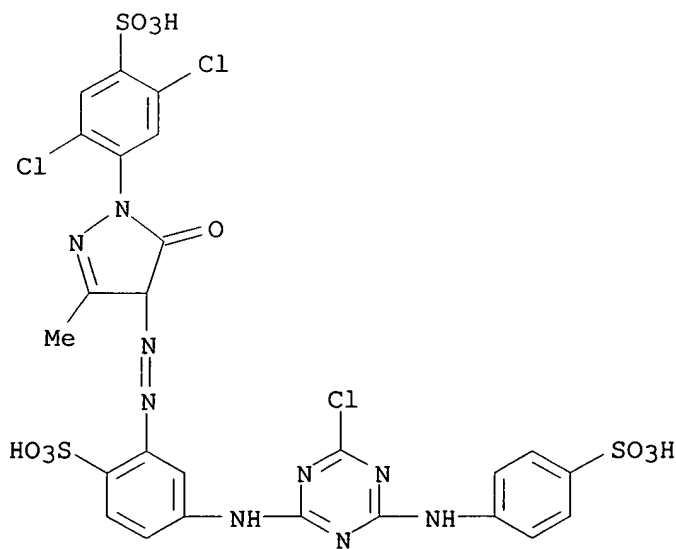
CN 2,7-Naphthalenedisulfonic acid, 5-(benzoylamino)-3-[[5-[[4-chloro-6-[(4-sulphophenyl)amino]-1,3,5-triazin-2-yl]amino]-2-sulphophenyl]azo]-4-hydroxy-, tetrasodium salt (9CI) (CA INDEX NAME)



● 4 Na

IT 50662-99-2D, C.I. 18972, reaction products with sulfinated
polymers
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical
 process); TEM (Technical or engineered material use); PROC (Process); USES
 (Uses)
 (Cibacron Brilliant Yellow; production of oligomers and **polymers**
 containing sulfinate groups)
 RN 50662-99-2 HCAPLUS
 CN Benzenesulfonic acid, 4-[[[4-chloro-6-[(4-sulfophenyl)amino]-1,3,5-triazin-
 2-yl]amino]-2-[[[1-(2,5-dichloro-4-sulfophenyl)-4,5-dihydro-3-methyl-5-oxo-
 1H-pyrazol-4-yl]azo]-, trisodium salt (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A

● 3 Na

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 9 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:475978 HCAPLUS

DN 139:351042

TI Lithium organic salts with extra functionalities

AU Ollivrin, X.; Alloin, F.; Le Nest, J.-F.; Benrabah, D.; Sanchez, J.-Y.

CS Laboratoire d'Electrochimie et de Physicochimie des Materiaux et des Interfaces (LEPMI), UMR 5631, CNRS-INPG-UJF, Saint-Martin-d'Heres, 38402, Fr.

SO Electrochimica Acta (2003), 48(14-16), 1961-1969

CODEN: ELCAAV; ISSN: 0013-4686

PB Elsevier Science Ltd.

DT Journal

LA English

AB Lithium perfluorosulfonate salts were incorporated to end-functionalized-PEO to enhance solvating and/or **plasticizing** effects or polarity. The compns. are a host **polymer** of **crosslinked** poly(ethylene oxide), the ionomer salts were prepared from piperazine end-capped poly(ethylene glycol) by isomerization of sultone and the mol. salts were obtained by reaction of secondary diamines with the linear isomer of hexafluoropropane sultone. The modifications resulted in improvements in ionic conductivity and cation transference number of ionomers and salts.

CC 35-8 (Chemistry of Synthetic High **Polymers**)

Section cross-reference(s): 37, 72, 76

IT Transference number

(cationic; preparation of lithium perfluorosulfonate - piperazine PEO ionomer **electrolytes** with improved ionic conductivity and transference number)

IT Redox reaction

(electrochem.; preparation of lithium perfluorosulfonate - piperazine PEO ionomer **electrolytes** with improved ionic conductivity and transference number)

IT **Crosslinking**

(photochem.; preparation of lithium perfluorosulfonate - piperazine PEO ionomer **electrolytes** with improved ionic conductivity and transference number)

IT Ionic conductivity

Isomerization

Polymer electrolytes

(preparation of lithium perfluorosulfonate - piperazine PEO ionomer **electrolytes** with improved ionic conductivity and transference number)

IT 618891-63-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(intermediate; preparation of lithium perfluorosulfonate - piperazine PEO ionomer **electrolytes** with improved ionic conductivity and transference number)

IT 106797-53-9, Irgacure 2959

RL: CAT (Catalyst use); USES (Uses)

(photoinitiator; preparation of lithium perfluorosulfonate - piperazine PEO ionomer **electrolytes** with improved ionic conductivity and transference number)

IT **618891-65-9P 618891-66-0P 618891-67-1P**

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(preparation and ionic conductivity and cation transference number of

lithium

perfluorosulfonate-diamine salts and complexes with linear PEO and

mixts. with ionomer salts)

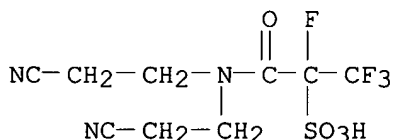
IT 111-95-5, 2,2'-Dimethoxydiethylamine 142-84-7, N,N-Dipropylamine
754-41-6, 2-(Fluorosulfonyl)tetrafluoropropionyl fluoride
 1310-65-2, Lithium hydroxide 35855-66-4, 3-(2-Methoxyethylamino)
propionitrile
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (preparation and ionic conductivity and cation transference number of
 lithium
 perfluorosulfonate-diamine salts and complexes with linear PEO and
 mixts. with ionomer salts)

IT 618891-64-8P
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (preparation of lithium perfluorosulfonate - piperazine PEO ionomer
electrolytes with improved ionic conductivity and transference number)

IT 110-85-0, Piperazine, reactions **773-15-9**, 3-(Trifluoromethyl)-
 3,4,4-trifluoro-1-oxa-2-thiacyclobutane 2,2-dioxide 27252-69-3,
 α,ω -Dichloro-poly(ethylene glycol)
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of lithium perfluorosulfonate - piperazine PEO ionomer
electrolytes with improved ionic conductivity and transference number)

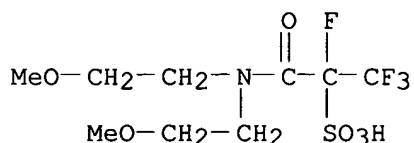
IT **618891-65-9P 618891-66-0P 618891-67-1P**
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (preparation and ionic conductivity and cation transference number of
 lithium
 perfluorosulfonate-diamine salts and complexes with linear PEO and
 mixts. with ionomer salts)

RN 618891-65-9 HCAPLUS
 CN 2-Propanesulfonic acid, 3-[bis(2-cyanoethyl)amino]-1,1,1,2-tetrafluoro-3-
 oxo-, lithium salt (9CI) (CA INDEX NAME)



● Li

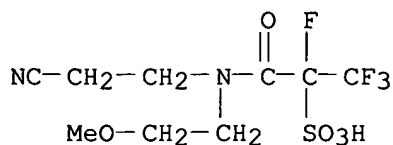
RN 618891-66-0 HCAPLUS
 CN 2-Propanesulfonic acid, 3-[bis(2-methoxyethyl)amino]-1,1,1,2-tetrafluoro-3-
 oxo-, lithium salt (9CI) (CA INDEX NAME)



● Li

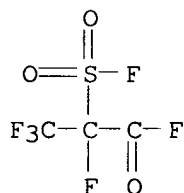
RN 618891-67-1 HCAPLUS

CN 2-Propanesulfonic acid, 3-[(2-cyanoethyl)(2-methoxyethyl)amino]-1,1,1,2-tetrafluoro-3-oxo-, lithium salt (9CI) (CA INDEX NAME)

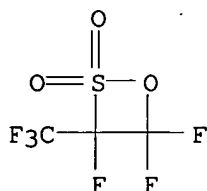


● Li

IT 754-41-6, 2-(Fluorosulfonyl)tetrafluoropropionyl fluoride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation and ionic conductivity and cation transference number of lithium perfluorosulfonate-diamine salts and complexes with linear PEO and mixts. with ionomer salts)
 RN 754-41-6 HCAPLUS
 CN Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-(fluorosulfonyl)- (9CI) (CA INDEX NAME)



IT 773-15-9, 3-(Trifluoromethyl)-3,4,4-trifluoro-1-oxa-2-thiacyclobutane 2,2-dioxide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of lithium perfluorosulfonate - piperazine PEO ionomer **electrolytes** with improved ionic conductivity and transference number)
 RN 773-15-9 HCAPLUS
 CN 1,2-Oxathietane, 3,4,4-trifluoro-3-(trifluoromethyl)-, 2,2-dioxide (8CI, 9CI) (CA INDEX NAME)



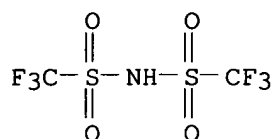
RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 10 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:983140 HCAPLUS

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

DN 138:274021
 TI Swollen Polymethacrylonitrile Urethane Networks for Lithium Batteries
 AU Belieres, J.-P.; Marechal, M.; Saunier, J.; Alloin, F.; Sanchez, J.-Y.
 CS Laboratoire d'Electrochimie et de Physicochimie des Materiaux et des
 Interfaces, UMR 5631, CNRS-INPG-UJF, Saint-Martin-d'Heres, Fr.
 SO Journal of the Electrochemical Society (2003), 150(1), A14-A20
 CODEN: JESOAN; ISSN: 0013-4651
 PB Electrochemical Society
 DT Journal
 LA English
 AB Copolymers of methacrylonitrile are reported. Surprisingly, their curing
 through urethane cross-links acts as an internal **plasticization**.
 This **crosslinking** prevents any dissoln. or leakage, up to
 90°, when the networks are swollen by liquid organic
electrolytes. These provide high conductivities, and the increase
 in resistivity with respect to pure liquid **electrolytes** remains
 ≤2. The electrochem. study shows a clear improvement of stability
 in reduction as compared to polyacrylonitrile. The 1st evaluations of lithium
 insertion in graphite are encouraging.
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST swollen polymethacrylonitrile urethane network lithium battery separator
 carbonate **electrolyte**
 IT Acrylic **polymers**, uses
 RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)
 (polyurethane-; swollen polymethacrylonitrile urethane networks for
 lithium batteries)
 IT **Polymerization**
 (radical; swollen polymethacrylonitrile urethane networks for lithium
 batteries)
 IT **Crosslinking**
 Cyclic voltammetry
 Electric resistance
 Gels
 Ionic conductivity
Polymer electrolytes
Polymer networks
 Secondary battery separators
 (swollen polymethacrylonitrile urethane networks for lithium batteries)
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7,
 Propylene carbonate 616-38-6, Dimethyl carbonate
 RL: DEV (Device component use); USES (Uses)
 (carbonate **electrolyte** solns. with lithium salts, and
 polyacrylic-urethane gels swollen with; swollen polymethacrylonitrile
 urethane networks for lithium batteries)
 IT 21324-40-3, Lithium hexafluorophosphate (LiPF6) **90076-65-6**,
 Lithium bis(trifluoromethanesulfonyl)imide
 RL: DEV (Device component use); USES (Uses)
 (swollen polymethacrylonitrile urethane networks for lithium batteries)
 IT 33897-34-6P, Hydroxyethyl methacrylate-**Methacrylonitrile**
 copolymer 255875-15-1P 255875-23-1P
 RL: PRP (Properties); **RCT (Reactant)**; SPN (Synthetic
 preparation); PREP (Preparation); RACT (Reactant or reagent)
 (swollen **polymethacrylonitrile** urethane networks for lithium
 batteries)
 IT 584-84-9, Tolyene-2,4-diisocyanate 822-06-0, Hexamethylene diisocyanate
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (swollen **polymethacrylonitrile** urethane networks for lithium
 batteries)

IT 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide
 RL: DEV (Device component use); USES (Uses)
 (swollen polymethacrylonitrile urethane networks for lithium batteries)
 RN 90076-65-6 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
 lithium salt (9CI) (CA INDEX NAME)



● Li

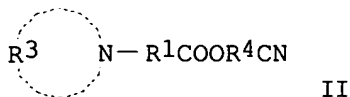
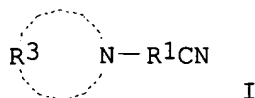
RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 11 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:638186 HCAPLUS
 DN 137:192762
 TI Amine compounds, resist compositions and patterning process
 IN Hatakeyama, Jun; Kobayashi, Tomohiro; Watanabe, Takeru
 PA Shin-Etsu Chemical Co., Ltd., Japan
 SO U.S. Pat. Appl. Publ., 40 pp.
 CODEN: USXXCO

DT Patent
 LA English

FAN.CNT 1

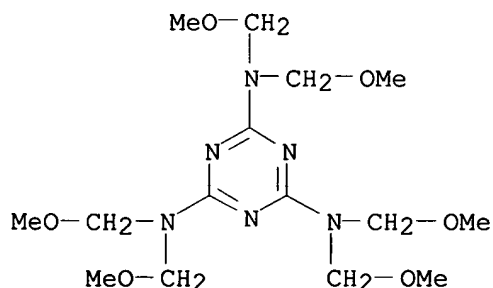
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002115018	A1	20020822	US 2001-3288	20011206
	US 6743564	B2	20040601		
	JP 2002249478	A2	20020906	JP 2001-369719	20011204
PRAI	JP 2000-373316	A	20001207		
OS	MARPAT 137:192762				
GI					



AB Amine compds. having a cyano group are useful in resist compns. for preventing a resist film from thinning and also for enhancing the resolution and focus margin of resist. The invention amine compds. have general formulas: (R²)b-N-(R¹-CN)a; I; (R²)b-N-(R¹C(=O)OR⁴-CN)a; II (R¹,4 = C1-4

alkylene; R2 = C1-20 cycloc alkyl which may contain a hydroxy group, ether, carbonyl, ester, lactone ring, carbonate, cyano group; R3 = C2-20 alkylene which may contain hydroxy, ether, thioether, carbonyl, ester, thioester group, carbonate; a = 1-3; a+b = 3).

- IC ICM G03F007-038
ICS G03F007-039; G03F007-38
- NCL 430270100
- CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): **38**
- IT **3089-11-0**
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(**crosslinker**; amine compds. and photoresist compns. for patterning process)
- IT 117458-06-7 138529-81-4 **144317-44-2** 266308-64-9
RL: TEM (Technical or engineered material use); USES (Uses)
(photoacid generator; amine compds. and photoresist compns. for patterning process)
- IT 64-18-6, Formic acid, reactions 75-04-7, Ethylamine, reactions 96-33-3, Methyl acrylate 106-71-8 107-13-1, **Acrylonitrile**, reactions 109-85-3, 2-Methoxyethylamine 109-89-7, Diethylamine, reactions 110-89-4, Piperidine, reactions 110-91-8, Morpholine, reactions 111-42-2, Diethanolamine, reactions 111-95-5 121-44-8, Triethylamine, reactions 123-75-1, Pyrrolidine, reactions 141-43-5, 2-Aminoethanol, reactions 156-87-6, 3-Hydroxy-1-propylamine 590-17-0, **Bromoacetonitrile** 929-06-6 4795-29-3, Tetrahydrofurfurylamine 5332-06-9, 4-**Bromobutyronitrile** 13818-40-1, Cyanomethyl acrylate 22483-09-6, 2,2-Dimethoxyethylamine 74264-63-4 449165-37-1
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(preparation of amine compds. and photoresist compns. for patterning process)
- IT **3089-11-0**
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(**crosslinker**; amine compds. and photoresist compns. for patterning process)
- RN 3089-11-0 HCAPLUS
- CN 1,3,5-Triazine-2,4,6-triamine, N,N,N',N',N'',N''-hexakis(methoxymethyl)-(9CI) (CA INDEX NAME)



- IT **144317-44-2**
RL: TEM (Technical or engineered material use); USES (Uses)
(photoacid generator; amine compds. and photoresist compns. for patterning process)
- RN 144317-44-2 HCAPLUS

CN Sulfonium, triphenyl-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonic acid (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 45187-15-3

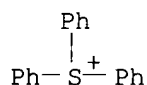
CMF C4 F9 O3 S

$^{-}O_3S-(CF_2)_3-CF_3$

CM 2

CRN 18393-55-0

CMF C18 H15 S



L51 ANSWER 12 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:487624 HCAPLUS

DN 137:64371

TI **Crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and methods for preparing same

IN Ameduri, Bruno Michel; Manseri, Abdellatif; Boucher, Mario

PA Hydro-Quebec, Can.

SO PCT Int. Appl., 53 pp.

CODEN: PIXXD2

DT Patent

LA French

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	WO 2002050142	A1	20020627	WO 2001-CA1439	20011012	
	W:			AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM		
	RW:			GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG		
	CA 2328433	AA	20020620	CA 2000-2328433	20001220	
	CA 2427481	AA	20020627	CA 2001-2427481	20011012	
	AU 2002013687	A5	20020701	AU 2002-13687	20011012	
	EP 1355962	A1	20031029	EP 2001-981986	20011012	
	R:			AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR		
	JP 2004526000	T2	20040826	JP 2002-552032	20011012	
	US 2004097675	A1	20040520	US 2003-432957	20031106	
PRAI	CA 2000-2328433	A	20001220			

WO 2001-CA1439 W 20011012
 OS MARPAT 137:64371
 AB The invention concerns monomers corresponding to formula: $Z_2C: CWX(CY_2)_nCN$, wherein: X represents an oxygen atom or no atom; Z and Y represent a hydrogen or fluorine atom; W represents a hydrogen or fluorine atom or a CF_3 group; and n is a natural integer between 0 and 10 inclusively. Said monomers enable by means of novel copolymerization methods to prepare **crosslinkable** fluorosulfonated nitrile elastomers having very low glass transition temperature (T_g). Thus, **polymerization** of $CF_2:CFC_3H_6CN$ 4.6, $CF_2:CFOCF_2CF(CF_3)OC_2F_4SO_2F$ 28.4, and vinylidene fluoride 14 g in MeCN in the presence of tert-Bu peroxide, 15 h at 135° gave copolymer with $T_g -31^\circ$.
 IC ICM C08F214-22
 CC 39-4 (Synthetic Elastomers and Natural Rubber)
 ST **crosslinkable** fluorosulfonated nitrile rubber vinylidene fluoride based manuf; fluorohexenenitrile perfluoromethyldioxaoctenesulfonyl fluoride vinylidene fluoride copolymer manuf
 IT Heat-resistant materials
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance)
 IT Fuel cells
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for fuel cells)
 IT Ionomers
 RL: MSC (Miscellaneous)
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for ionomers)
 IT Seals (parts)
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for mech. seals)
 IT **Membranes**, nonbiological
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for membranes)
 IT **Polymer electrolytes**
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for polymer electrolytes)
 IT Pumps
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for pumps)
 IT Pipes and Tubes
 (**crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for tubes)
 IT Pistons
 (heads; **crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good heat resistance for piston heads)
 IT Fluoro rubber
 RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
 (perfluoromethyldioxaoctenesulfonyl fluoride-trifluorohexenenitrile-vinylidene fluoride; **crosslinkable** fluorosulfonated nitrile elastomers based on vinylidene fluoride with low glass temperature and good

heat resistance)

IT **Polymerization**
(radical; of perfluoromethyldioxaoctenesulfonyl fluoride with
trifluorohexanenitrile and vinylidene fluoride)

IT 354-61-0P, 1,2-Dichloro-1-iodotrifluoroethane 438627-62-4P,
5,6-Dichloro-3-iodo-5,6,6-trifluorohexanenitrile 438627-63-5P,
5,6-Dichloro-5,6,6-trifluorohexanenitrile
RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
(Preparation); RACT (Reactant or reagent)
(monomer precursor; **crosslinkable** fluorosulfonated
nitrile elastomers based on vinylidene fluoride with low glass
temperature and good heat resistance)

IT 79-38-9, Chlorotrifluoroethylene 109-75-1, Allyl cyanide
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(monomer precursor; **crosslinkable** fluorosulfonated
nitrile elastomers based on vinylidene fluoride with low glass
temperature and good heat resistance)

IT 203928-94-3P, 5,6,6-Trifluoro-5-hexanenitrile
RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
(Preparation); RACT (Reactant or reagent)
(monomer; **crosslinkable** fluorosulfonated **nitrile**
elastomers based on vinylidene fluoride with low glass temperature and good
heat resistance)

IT **438627-64-6P**
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
engineering or chemical process); PREP (Preparation); PROC (Process)
(rubber; **crosslinkable** fluorosulfonated nitrile elastomers
based on vinylidene fluoride with low glass temperature and good heat
resistance)

IT **438627-64-6P**
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
engineering or chemical process); PREP (Preparation); PROC (Process)
(rubber; **crosslinkable** fluorosulfonated nitrile elastomers
based on vinylidene fluoride with low glass temperature and good heat
resistance)

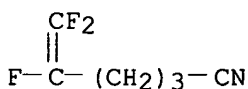
RN 438627-64-6 HCAPLUS

CN Ethanesulfonyl fluoride, 2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-
1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro-, polymer with
1,1-difluoroethene and 5,6,6-trifluoro-5-hexanenitrile (9CI) (CA INDEX
NAME)

CM 1

CRN 203928-94-3

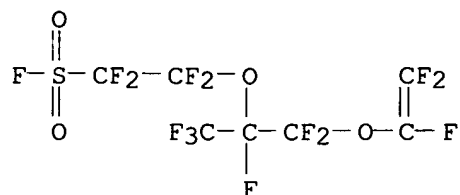
CMF C6 H6 F3 N



CM 2

CRN 16090-14-5

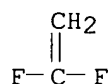
CMF C7 F14 O4 S



CM 3

CRN 75-38-7

CMF C2 H2 F2



RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 13 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:486454 HCAPLUS

DN 137:63924

TI **Polymer** structures for ion conductors with low resistance and high electrode efficiency and method for their manufacture

IN Arimura, Tomoaki

PA Nissan Motor Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002184463	A2	20020628	JP 2000-376480	20001211
PRAI	JP 2000-376480		20001211		

AB The structures bear polar functional groups and ionically mutually-interactive functional groups which form a spiral shape on their intramol. interaction where the ion conductors are obtained by dispersing electrolyte compds. in the **polymer** structures. Thus, stirring 8.6 g 2-amino-2-**phosphonitrilic** chloride **trimer** -2-oxetaneacetic acid with 9.68 g 2-amino-2-triphenyl(2-pyridylmethyl)phosphonium chloride-2-oxetaneacetic acid, 130 mL THF and 5.1 g LiN(CF₃SO₂) at 2000 rpm while adding 3.10 g N-ethyl-N'-3-dimethylaminopropylcarbodiimide and 0.5 g Sn 2-ethylhexanoate, reacting at -20° for 4 h, heating up to 90°, after holding for 120 s, cooling to -30° at -10°/min, holding for 240 s and drying in vacuo gave an ion conductor which was dissolved in 120 mL AcNMe₂, cast coated on a glass surface and dried to give a conductive film.

IC ICM H01M010-40

CC 37-3 (**Plastics** Manufacture and Processing)

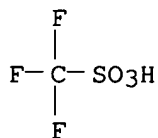
Section cross-reference(s): 52

ST ion conductor **polymer** spiral structure manuf

IT Secondary batteries

(lithium; **polymer** structures for ion conductors with low

- resistance and high electrode efficiency and method for manufacture)
- IT Conducting **polymers**
Electric conductors
Polymer electrolytes
(**polymer** structures for ion conductors with low resistance and high electrode efficiency and method for manufacture)
- IT **Polymer** morphology
(spiral **polymer** structures for ion conductors with low resistance and high electrode efficiency and method for manufacture)
- IT 1892-57-5, N-Ethyl-N'-3-dimethylaminopropylcarbodiimide
RL: RGT (Reagent); RACT (Reactant or reagent)
(dehydration condensation reagent; **polymer** structures for ion conductors with low resistance and high electrode efficiency and method for manufacture)
- IT 940-71-6DP, **Phosphonitrilic** chloride **trimer**, reaction products with 2-aminooxetaneacetic acid, lithium complexes, trifluoromethanesulfonate-containing **polymers** 7439-93-2DP, Lithium, spiral **polymer** complexes, trifluoromethanesulfonate-containing 394653-46-4DP, reaction products with **phosphonitrilic** chloride **trimer**, lithium complexes, trifluoromethanesulfonate-containing **polymers**
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**polymer** structures for ion conductors with low resistance and high electrode efficiency and method for manufacture)
- IT 301-10-0
RL: MOA (Modifier or additive use); USES (Uses)
(spiral structure-forming aids; **polymer** structures for ion conductors with low resistance and high electrode efficiency and method for manufacture)
- IT **33454-82-9**, Lithium triflate
RL: TEM (Technical or engineered material use); USES (Uses)
(support electrolyte; **polymer** structures for ion conductors with low resistance and high electrode efficiency and method for manufacture)
- IT **33454-82-9**, Lithium triflate
RL: TEM (Technical or engineered material use); USES (Uses)
(support electrolyte; **polymer** structures for ion conductors with low resistance and high electrode efficiency and method for manufacture)
- RN 33454-82-9 HCAPLUS
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

L51 ANSWER 14 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:25856 HCAPLUS
DN 136:85613

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

TI Method for preparation of sulfonate and fluorine-containing nitrile compounds

IN Okada, Shinji; Watakabe, Atsushi

PA Asahi Glass Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002003466	A2	20020109	JP 2000-189621	20000623
PRAI	JP 2000-189621		20000623		

OS CASREACT 136:85613

AB Cyanoperfluoroalkanesulfonic acid derivs. represented by formula $\text{HOSO}_2\text{CF}_2[\text{CF}_2\text{OCF}(\text{CF}_3)]_n\text{CN}$ (I; $n = 0, 1, 2, 3$) are prepared by hydrolysis of fluorosulfonyl fluoro nitriles represented by formula $\text{FSO}_2\text{CF}_2[\text{CF}_2\text{OCF}(\text{CF}_3)]_n\text{CN}$ ($n = \text{same as above}$) in the presence of tertiary amine followed by contacting the tertiary amine salt with acidic ion exchange resin. Unlike using alkali such as K_2CO_3 , this process selectively hydrolyzes fluorosulfonyl group over cyano group. These compds. I are useful as intermediates for triazine-containing low mol. or **polymer electrolytes** as proton conductors of the **membrane** or catalyst bed in fuel cells. Thus, 346 g $\text{FSO}_2\text{CF}_2\text{CF}_2\text{OCF}(\text{CF}_3)\text{COF}$ and 450 mL Et_2O were cooled at -70° , treated dropwise with 17 g $\text{NH}_3(1)$, allowed to react at -70° for 0.5 h, and warmed to room temperature over 2 h to give 303 g $\text{FSO}_2\text{CF}_2\text{CF}_2\text{OCF}(\text{CF}_3)\text{CONH}_2$ (II). A solution of 286 g II in 1,200 g DMF was cooled at 0° , slowly treated dropwise with 221 g trifluoroacetic anhydride over 0.5 h and then 167 g pyridine over 1 h at $2-4^\circ$, and stirred for 0.5 h to give 201 g $\text{FSO}_2\text{CF}_2\text{CF}_2\text{OCF}(\text{CF}_3)\text{CN}$ (III) in 70.3% yield. III (130 g) was slowly added dropwise to a mixed solution of 7.2 g H_2O and 226 g pyridine at 0° and stirred at room temperature for 3 h, followed by passing the reaction mixture through a column of Diaion SK 1BN ion exchange resin (Mitsubishi Chemical Corp., Japan) to give 109.2 g I ($n = 1$) in 84% yield.

IC ICM C07C303-02

ICS C07C309-13; H01B001-06; H01B013-00; H01M008-02; H01M008-10; H01M010-40; C07D251-24

CC 23-19 (Aliphatic Compounds)

Section cross-reference(s): 76

ST cyanoperfluoroalkanesulfonic acid prepn intermediate fuel cell

electrolyte; sulfonate fluorine contg nitrile prepn; fluorosulfonyl fluoro nitrile hydrolysis; tertiary amine hydrolysis catalyst

IT Fuel cell **electrolytes**

Polymer electrolytes

(preparation of sulfonate and fluorine-containing nitrile compds. as intermediates for triazine-containing low mol. or **polymer electrolytes** as proton conductors of the **membrane** or catalyst bed in fuel cells)

IT Amines, reactions

RL: **RCT (Reactant)**; RACT (Reactant or reagent)

(tertiary; preparation of sulfonate and fluorine-containing **nitrile** compds. by selective hydrolysis of fluorosulfonyl fluoro **nitrile** compound in presence of tertiary amine and treatment with cation exchange resin)

IT 382595-00-8P 382595-03-1P

RL: IMF (Industrial manufacture); **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

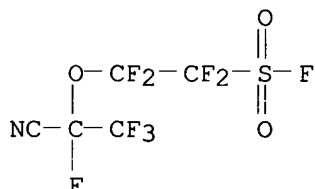
(preparation of sulfonate and fluorine-containing **nitrile** compds. by selective hydrolysis of fluorosulfonyl fluoro **nitrile** compound in presence of tertiary amine and treatment with cation exchange resin)

IT 386273-59-2P 386273-60-5P 386273-61-6P
386273-62-7P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of sulfonate and fluorine-containing nitrile compds. by selective hydrolysis of fluorosulfonyl fluoro nitrile compound in presence of tertiary amine and treatment with cation exchange resin)

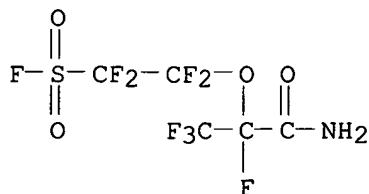
IT 110-86-1, Pyridine, reactions 4089-57-0 82197-06-6, Diaion SK-1BN 198140-97-5 382595-01-9 382595-02-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of sulfonate and fluorine-containing **nitrile** compds. by selective hydrolysis of fluorosulfonyl fluoro **nitrile** compound in presence of tertiary amine and treatment with cation exchange resin)

IT 382595-00-8P 382595-03-1P
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of sulfonate and fluorine-containing **nitrile** compds. by selective hydrolysis of fluorosulfonyl fluoro **nitrile** compound in presence of tertiary amine and treatment with cation exchange resin)

RN 382595-00-8 HCAPLUS
CN Ethanesulfonyl fluoride, 2-(1-cyano-1,2,2,2-tetrafluoroethoxy)-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)

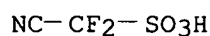


RN 382595-03-1 HCAPLUS
CN Ethanesulfonyl fluoride, 2-[1-(aminocarbonyl)-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)

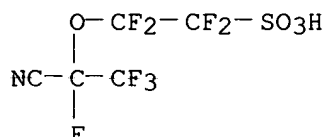


IT 386273-59-2P 386273-60-5P 386273-61-6P
386273-62-7P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of sulfonate and fluorine-containing nitrile compds. by selective hydrolysis of fluorosulfonyl fluoro nitrile compound in presence of tertiary amine and treatment with cation exchange resin)

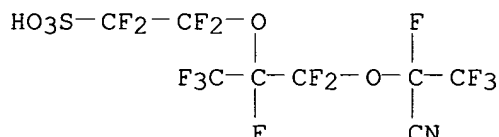
RN 386273-59-2 HCAPLUS
 CN Methanesulfonic acid, cyanodifluoro- (9CI) (CA INDEX NAME)



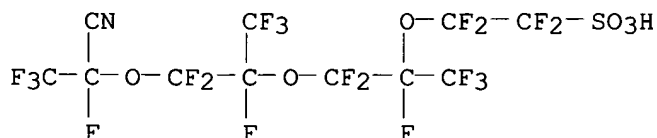
RN 386273-60-5 HCAPLUS
 CN Ethanesulfonic acid, 2-(1-cyano-1,2,2,2-tetrafluoroethoxy)-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



RN 386273-61-6 HCAPLUS
 CN Ethanesulfonic acid, 2-[1-[(1-cyano-1,2,2,2-tetrafluoroethoxy)difluoromethyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



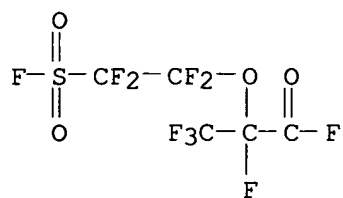
RN 386273-62-7 HCAPLUS
 CN Ethanesulfonic acid, 2-[1-[[1-[(1-cyano-1,2,2,2-tetrafluoroethoxy)difluoromethyl]-1,2,2,2-tetrafluoroethoxy]difluoromethyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



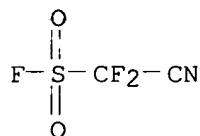
IT 4089-57-0 198140-97-5 382595-01-9
 382595-02-0

RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of sulfonate and fluorine-containing **nitrile** compds. by selective hydrolysis of fluorosulfonyl fluoro **nitrile** compound in presence of tertiary amine and treatment with cation exchange resin)

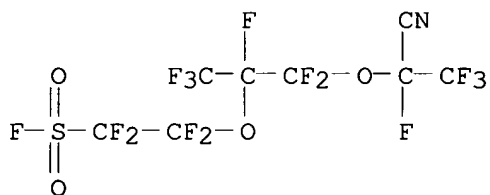
RN 4089-57-0 HCAPLUS
 CN Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,2-tetrafluoro-2-(fluorosulfonyl)ethoxy]- (9CI) (CA INDEX NAME)



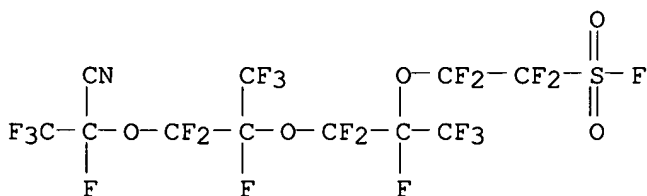
RN 198140-97-5 HCAPLUS
CN Methanesulfonyl fluoride, cyanodifluoro- (9CI) (CA INDEX NAME)



RN 382595-01-9 HCAPLUS
CN Ethanesulfonyl fluoride, 2-[1-[(1-cyano-1,2,2,2-tetrafluoroethoxy)difluoromethyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



RN 382595-02-0 HCAPLUS
CN Ethanesulfonyl fluoride, 2-[1-[[1-[(1-cyano-1,2,2,2-tetrafluoroethoxy)difluoromethyl]-1,2,2,2-tetrafluoroethoxy]difluoromethyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



L51 ANSWER 15 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:930203 HCAPLUS
DN 136:53537
TI Preparation of high-boiling fluoronitriles as materials for **crosslinkable** perfluorocarbon **polymers** for battery **electrolytes**
IN Okada, Shinji; Watakabe, Atsushi

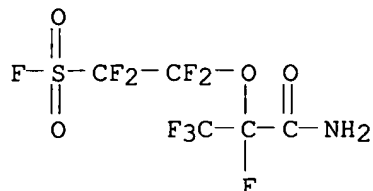
KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505



PA Asahi Glass Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001354641	A2	20011225	JP 2000-176613	20000613
PRAI	JP 2000-176613		20000613		
OS	CASREACT 136:53537				
AB	FSO2CF2CF2O[CF(CF3)CF2O]nCF(CF3)C.tplbond.N (n = 0-2) are prepared by amidation of FSO2CF2CF2O[CF(CF3)CF2O]nCF(CF3)COF with NH3, followed by dehydration. Thus, amidation of FSO2CF2CF2OCF(CF3)COF with liquid NH3 at -70° in ether gave FSO2CF2CF2OCF(CF3)CONH2, which was treated with (CF3CO)2O in the presence of pyridine at 2-4° for 0.5 h in DMF to afford 70.3% FSO2CF2CF2OCF(CF3)C.tplbond.N with b.p. 89°.				
IC	ICM C07C303-22				
	ICS C07C309-87; H01B001-06; H01M008-02; H01M008-10				
CC	23-19 (Aliphatic Compounds) Section cross-reference(s): 35, 52				
ST	fluoronitrile prepn material crosslinkable perfluorocarbon polymer ; battery electrolyte fluoronitrile prepn; fluorocarbonyl fluoride amidation dehydration				
IT	Polyethers, preparation RL: PNU (Preparation, unclassified); PREP (Preparation) (perfluoro; preparation of high-boiling fluoronitriles as materials for crosslinkable perfluorocarbon polymers for battery electrolytes)				
IT	Fluoropolymers, preparation RL: PNU (Preparation, unclassified); PREP (Preparation) (polyether-, perfluoro; preparation of high-boiling fluoronitriles as materials for crosslinkable perfluorocarbon polymers for battery electrolytes)				
IT	Battery electrolytes (preparation of high-boiling fluoronitriles as materials for crosslinkable perfluorocarbon polymers for battery electrolytes)				
IT	382595-03-1P RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (preparation of)				
IT	382595-00-8P 382595-01-9P 382595-02-0P RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation) (preparation of high-boiling fluoronitriles as materials for crosslinkable perfluorocarbon polymers for battery electrolytes)				
IT	4089-57-0 4089-58-1 4628-44-8 RL: RCT (Reactant); RACT (Reactant or reagent) (preparation of high-boiling fluoronitriles as materials for crosslinkable perfluorocarbon polymers for battery electrolytes)				
IT	382595-03-1P RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (preparation of)				
RN	382595-03-1 HCAPLUS				
CN	Ethanesulfonyl fluoride, 2-[1-(aminocarbonyl)-1,2,2,2-tetrafluoroethoxy]-				

1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



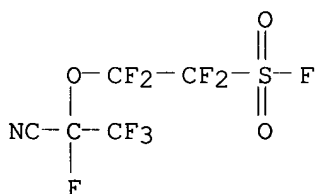
IT 382595-00-8P 382595-01-9P 382595-02-0P

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(preparation of high-boiling fluoronitriles as materials for crosslinkable perfluorocarbon polymers for battery electrolytes)

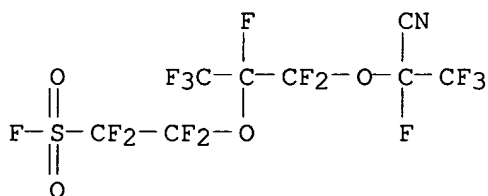
RN 382595-00-8 HCAPLUS

CN Ethanesulfonyl fluoride, 2-(1-cyano-1,2,2,2-tetrafluoroethoxy)-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



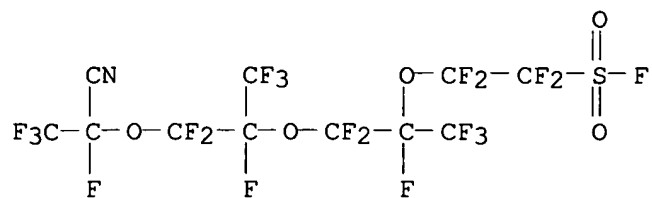
RN 382595-01-9 HCAPLUS

CN Ethanesulfonyl fluoride, 2-[1-[(1-cyano-1,2,2,2-tetrafluoroethoxy)difluoromethyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



RN 382595-02-0 HCAPLUS

CN Ethanesulfonyl fluoride, 2-[1-[[1-[(1-cyano-1,2,2,2-tetrafluoroethoxy)difluoromethyl]-1,2,2,2-tetrafluoroethoxy]difluoromethyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoro- (9CI) (CA INDEX NAME)



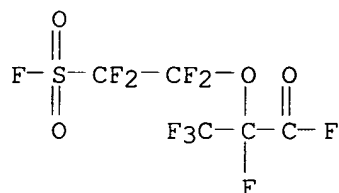
IT 4089-57-0 4089-58-1 4628-44-8

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of high-boiling **fluoronitriles** as materials for **crosslinkable** perfluorocarbon **polymers** for battery **electrolytes**)

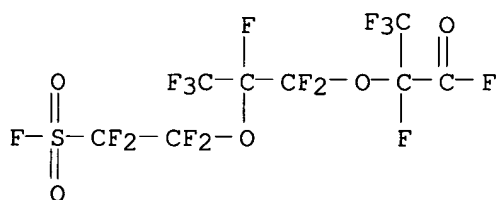
RN 4089-57-0 HCAPLUS

CN Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,2-tetrafluoro-2-(fluorosulfonyl)ethoxy]- (9CI) (CA INDEX NAME)



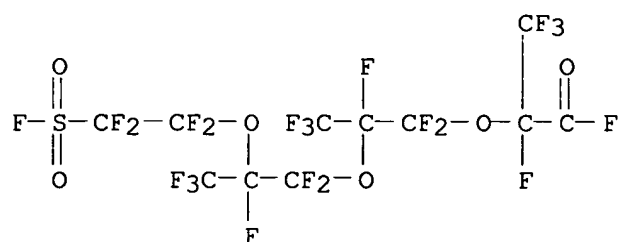
RN 4089-58-1 HCAPLUS

CN Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,3,3,3-hexafluoro-2-[1,1,2,2-tetrafluoro-2-(fluorosulfonyl)ethoxy]propoxy]- (9CI) (CA INDEX NAME)



RN 4628-44-8 HCAPLUS

CN Propanoyl fluoride, 2,3,3,3-tetrafluoro-2-[1,1,2,3,3,3-hexafluoro-2-[1,1,2,3,3,3-hexafluoro-2-[1,1,2,2-tetrafluoro-2-(fluorosulfonyl)ethoxy]propoxy]propoxy]- (9CI) (CA INDEX NAME)



L51 ANSWER 16 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:2015 HCAPLUS

DN 132:110489

TI Ionic conductivity and electrochemical characterization of novel microporous composite **polymer electrolytes**

AU Xu, Wu; Siow, Kok Siong; Gao, Zhiqiang; Lee, Swee Yong

CS Department of Chemistry, National University of Singapore, Singapore,
119260, Singapore

SO Journal of the Electrochemical Society (1999), 146(12), 4410-4418

CODEN: JESOAN; ISSN: 0013-4651

PB Electrochemical Society

DT Journal

LA English

AB Composi

by encapsulating electrolyte solns. of inorg. lithium salts dissolved in a plasticizer or mixture of plasticizers such as ethylene carbonate (EC), propylene carbonate (PC), γ -butyrolactone (BL) and di-Me carbonate (DMC), into porous polymer membranes. These polymer membranes are obtained from microemulsion polymerization of the microemulsion system of acrylonitrile, 4-vinylbenzenesulfonic acid lithium salt, ethylene glycol dimethacrylate (as cross-linker), ω -methoxy poly(ethyleneoxy)40 undecyl- α -methacrylate (as surfactant), and water. These CPEs exhibit conductivities of 3.1×10^{-4} to 1.2×10^{-3} S cm⁻¹ at room temperature. The lithium ion transference number, measured using a dc polarization method coupled with ac impedance spectroscopy, is found to be ca. 0.45. Cyclic voltammetry of the CPEs on stainless steel electrodes shows electrochem. stability windows extending up to 3.9, 4.0, and 4.4 V vs. Li⁺/Li for CPEs with 1M LiSO₃CF₃/EC-PC (1:1 by volume), 1M LiBF₄/BL and 1M LiClO₄/EC-DMC (1:1 by volume), resp. The impedance of the Li/CPE interface for the CPE with 1M LiClO₄/EC-DMC under open circuit conditions is found to increase over storage time. Preliminary charge-discharge tests of prototype Li/CPE/LiMn₂O₄ cells show an initial discharge capacity of ca. 118 mAh g⁻¹ of LiMn₂O₄ at a discharge current rate of 0.10 mA cm⁻², and promising cyclability.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): **38, 76**

ST battery **electrolyte** microporous composite **polymer**

IT Battery electrolytes

Electric impedance

Ionic conductivity

Polymer electrolytes

Transference number

(ionic conductivity and electrochem. characterization of novel microporous composite **polymer electrolytes**)

IT Polyoxyalkylenes, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (ionic conductivity and electrochem. characterization of novel microporous
 composite **polymer electrolytes**)

IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (ionic conductivity and electrochem. characterization of novel microporous
 composite **polymer electrolytes**)

IT Secondary batteries
 (lithium; ionic conductivity and electrochem. characterization of novel
 microporous composite **polymer electrolytes**)

IT **Polymerization**
 (microemulsion; ionic conductivity and electrochem. characterization of
 novel
 microporous composite **polymer electrolytes**)

IT Emulsions
 (microemulsions; ionic conductivity and electrochem. characterization of
 novel
 microporous composite **polymer electrolytes**)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7,
 Propylene carbonate 616-38-6, Dimethyl carbonate 7439-93-2, Lithium,
 uses 12057-17-9, Lithium manganese oxide LiMn_2O_4
 RL: DEV (Device component use); USES (Uses)
 (ionic conductivity and electrochem. characterization of novel microporous
 composite **polymer electrolytes**)

IT 7439-93-2D, Lithium, polyoxyalkylene-acrylate complexes, uses 7791-03-9,
 Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate
33454-82-9, Lithium trifluoromethanesulfonate 237770-04-6D,
 polyoxyalkylene-acrylate complexes
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (ionic conductivity and electrochem. characterization of novel microporous
 composite **polymer electrolytes**)

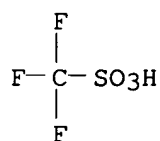
IT 107-13-1, **Acrylonitrile**, reactions
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (ionic conductivity and electrochem. characterization of novel microporous
 composite **polymer electrolytes**)

IT 24937-79-9, PvdF
 RL: TEM (Technical or engineered material use); USES (Uses)
 (ionic conductivity and electrochem. characterization of novel microporous
 composite **polymer electrolytes**)

IT **33454-82-9**, Lithium trifluoromethanesulfonate
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (ionic conductivity and electrochem. characterization of novel microporous
 composite **polymer electrolytes**)

RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 17 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1999:96208 HCAPLUS
 DN 130:168015
 TI Ionic perfluorosulfonimide compounds with delocalized anionic charge, and their use as components of ionic conductors or catalysts
 IN Armand, Michel; Michot, Christophe; Yagupolskii, Yurii; Yagupolskii, Lev; Bezudny, Andrej; Kondratenko, Natalya
 PA Acep Inc., Can.; Universite de Montreal; Centre National de la Recherche Scientifique; Institute of Organic Chemistry
 SO PCT Int. Appl., 59 pp.
 CODEN: PIXXD2
 DT Patent
 LA French

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9905100	A1	19990204	WO 1998-FR1663	19980727
	W: CA, JP, UA, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2266643	AA	19990204	CA 1998-2266643	19980727
	EP 928287	A1	19990714	EP 1998-941464	19980727
	EP 928287	B1	20031001		
	R: DE, FR, GB, IT				
	JP 2001507043	T2	20010529	JP 1999-509451	19980727
	EP 1388546	A2	20040211	EP 2003-292375	19980727
	EP 1388546	A3	20040303		
	R: DE, FR, GB, IT				
	US 6340716	B1	20020122	US 1999-269264	19990325
	US 2002013381	A1	20020131	US 2001-931076	20010817
	US 6548567	B2	20030415		
	US 2003195269	A1	20031016	US 2003-366450	20030214
	US 2004162362	A9	20040819		
	US 6841638	B2	20050111		
PRAI	CA 1997-2211465	A	19970725		
	EP 1998-941464	A3	19980727		
	WO 1998-FR1663	W	19980727		
	US 1999-269264	A3	19990325		
	US 2001-931076	A3	20010817		

OS MARPAT 130:168015

AB The invention concerns ionic compds. of formula $[R_1X_1(:Z_1)Q-X_2(:Z_2)R_2]_m$ Mm^+ [I; in which Mm^+ is a cation of valence m; each $X_i = S:Z_3$, $S:Z_4$, PR_3 , or PR_4 ; $Q = N$, CR_5 , CCN , or CSO_2R_5 ; each $Z_i = :O$, $:NC.tplbond.N$, $:C(C.tplbond.N)_2$, $:NS(:Z)2R_6$, or $:C[S(=Z)2R_6]_2$; each $R_i = Y$, YO , YS , Y_2N , or F ; $Y =$ monovalent organic radical, or repeat unit of a **polymeric fabric**]. I are useful for preparing materials with ionic conduction, **electrolytes**, as catalysts for **polymerization** and other organic reactions, and for doping **polymers**. For instance, butanesulfonyl chloride was condensed with $CF_3SO_2NH_2$ using DABCO, and the product treated with saturated KCl and AcOH to give crystalline

BuSO₂N(K)SO₂CF₃.

This was treated with $(COCl)_2$ and DMF in MeCN, followed by treatment with $CF_3SO_2NH_2$ and DABCO, and then workup with aqueous KCl and AcOH, to give title compound $CF_3SO_2N-S(:O)(Bu):NSO_2CF_3 K^+$. The latter was converted to the corresponding Li^+ salt using $LiBF_4$, and the Li salt was incorporated in poly(ethylene oxide) of mass 106 to give a film with conductivity $>2 \times 10^{-5}$ S/cm at 25°.

IC ICM C07C381-10
ICS C07C311-48; C07F007-18; C08K005-36; G02F001-15; H01M006-16

CC 23-12 (Aliphatic Compounds)
Section cross-reference(s): **35, 38, 67, 76**

ST perfluorosulfonimide ionic compd prepn conductor catalyst; delocalized
perfluorosulfonimide anion prepn dopant conducting **polymer**

IT **Polymerization** catalysts
(cationic; preparation of delocalized anionic perfluorosulfonimide derivs.
as conductors and catalysts)

IT **Crosslinking** catalysts
(photochem.; preparation of delocalized anionic perfluorosulfonimide derivs.
as conductors and catalysts)

IT **Polymerization** catalysts
(photopolymn.; preparation of delocalized anionic perfluorosulfonimide
derivs. as conductors and catalysts)

IT Addition reaction catalysts
Aldol condensation catalysts
Anions
Condensation reaction catalysts
Conducting **polymers**
Diels-Alder reaction catalysts
Electrolytes
Electron delocalization
Elimination reaction catalysts
Friedel-Crafts reaction catalysts
Isomerization catalysts
Oxidation catalysts
Polyelectrolytes
Polymerization catalysts
Primary batteries
Reduction catalysts
Secondary batteries
Solvolysis catalysts
(preparation of delocalized anionic perfluorosulfonimide derivs. as
conductors and catalysts)

IT Hydrocarbons, uses
RL: NUU (Other use, unclassified); USES (Uses)
(soluble **polymerization** catalyst for; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)

IT **Polymerization** catalysts
(stereoselective; preparation of delocalized anionic perfluorosulfonimide
derivs. as conductors and catalysts)

IT **220431-26-5P**
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);
USES (Uses)
(Diels-Alder catalyst; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)

IT **220431-45-8P**
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);
USES (Uses)
(acidic isomerization catalyst; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)

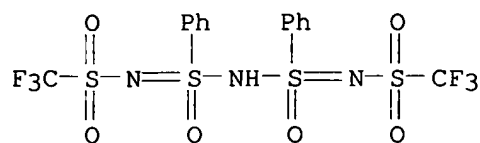
IT 75-56-9, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalyst for asym. **polymerization** of; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)

IT 107-25-5, Methyl vinyl ether
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalyst for isotactic **polymerization** of; preparation of delocalized

- anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **210227-42-2P**, N-[(Trifluoromethyl)sulfonyl]-1-butanefluoramide
potassium salt
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(chlorination and condensation with trifluoromethanesulfonamide; preparation
of delocalized anionic perfluorosulfonimide derivs. as conductors and
catalysts)
- IT **210227-20-6P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(chlorination; preparation of delocalized anionic perfluorosulfonimide
derivs. as conductors and catalysts)
- IT **220431-08-3P**
RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic
preparation); PREP (Preparation); USES (Uses)
(conductivity in poly(ethylene oxide); preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-09-4P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(conductivity in solution; preparation of delocalized anionic
perfluorosulfonimide
derivs. as conductors and catalysts)
- IT **220431-46-9P**
RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic
preparation); PREP (Preparation); USES (Uses)
(conductivity; preparation of delocalized anionic perfluorosulfonimide
derivs. as
conductors and catalysts)
- IT 109-77-3, **Malononitrile**
RL: RCT (Reactant); RACT (Reactant or reagent)
(condensation with benzenesulfonimidoyl fluoride derivative; preparation of
delocalized anionic perfluorosulfonimide derivs. as conductors and
catalysts)
- IT **30334-69-1**, Nonafluorobutanefluoramide
RL: RCT (Reactant); RACT (Reactant or reagent)
(condensation with bis(trifluoromethyl)trichlorophosphorane; preparation of
delocalized anionic perfluorosulfonimide derivs. as conductors and
catalysts)
- IT **156427-83-7**, N-(Trifluoromethylsulfonyl)phenylsulfonimidoyl
fluoride **220431-05-0** **220431-28-7**
RL: RCT (Reactant); RACT (Reactant or reagent)
(condensation with lithium nitride; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-10-7P**, N-[(Trifluoromethyl)sulfonyl]-1-octanesulfonamide
potassium salt **220431-30-1P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(condensation with lithium nitride; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-14-1P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP
(Preparation); RACT (Reactant or reagent)
(condensation with **malononitrile**; preparation of delocalized
anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-35-6P** **220431-36-7P** **220431-39-0P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(copolymn.; preparation of delocalized anionic perfluorosulfonimide derivs.

- as conductors and catalysts)
- IT **220431-13-0P**, 3,5-Bis(trifluoromethyl)-N-
 [(trifluoromethyl)sulfonyl]benzenesulfonamide potassium salt
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (fluorination; preparation of delocalized anionic perfluorosulfonimide
 derivs. as conductors and catalysts)
- IT **220430-60-4P 220430-66-0P 220431-16-3P**
220431-17-4DP, rare earth salts
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);
 USES (Uses)
 (multi-reaction catalyst; preparation of delocalized anionic
 perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-44-7**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (neutralization; preparation of delocalized anionic perfluorosulfonimide
 derivs. as conductors and catalysts)
- IT **220431-41-4P**
 RL: MOA (Modifier or additive use); POF (Polymer in formulation); PRP
 (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (polyelectrolyte; preparation of delocalized anionic perfluorosulfonimide
 derivs. as conductors and catalysts)
- IT 74-85-1, Ethene, reactions 115-07-1, 1-Propene, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (**polymerization** catalyst for; preparation of delocalized anionic
 perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-18-5P 220431-38-9P**
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);
 USES (Uses)
 (**polymerization** catalyst; preparation of delocalized anionic
 perfluorosulfonimide derivs. as conductors and catalysts)
- IT 88-12-0, reactions 115-11-7, Isobutylene, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (**polymerization** catalysts for; preparation of delocalized anionic
 perfluorosulfonimide derivs. as conductors and catalysts)
- IT 540-84-1P **220431-06-1P 220431-27-6P**
220431-29-8P 220431-31-2P 220431-34-5P
220431-47-0P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of delocalized anionic perfluorosulfonimide derivs. as
 conductors and catalysts)
- IT **220431-12-9P**
 RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic
 preparation); PREP (Preparation); USES (Uses)
 (properties; preparation of delocalized anionic perfluorosulfonimide derivs.
 as conductors and catalysts)
- IT 765-12-8, 3,6,9,12-Tetraoxatetradeca-1,13-diene 130668-21-2,
 Cyclohexanedimethanol divinyl ether
 RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or
 reagent); USES (Uses)
 (reactive solvent for **polymerization** catalyst; preparation of delocalized
 anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-11-8P**
 RL: MOA (Modifier or additive use); PRP (Properties); RCT (Reactant); SPN
 (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent);
 USES (Uses)
 (salt conversion; preparation of delocalized anionic perfluorosulfonimide
 derivs. as conductors and catalysts)
- IT **220431-07-2P 220431-15-2P 220431-23-2P**

- 220431-25-4P 220431-32-3P**
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (salt conversion; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT 80-62-6 100-42-5, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (soluble anionic catalyst for **polymerization** of; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT 108-88-3, Toluene, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (soluble **polymerization** catalyst for; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220430-58-0P**
 RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (soluble **polymerization** catalyst; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT 68-12-2, Dimethylformamide, uses 75-05-8, Acetonitrile, uses 109-99-9, Tetrahydrofuran, uses 110-71-4, Glyme 141-78-6, Acetic acid ethyl ester, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (solvent for **polymerization** catalyst; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-42-5P**
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (solubility; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **421-85-2**, Trifluoromethanesulfonamide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonamidation with butanesulfonyl chloride; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT 2386-60-9, Butanesulfonyl chloride 7795-95-1, Octanesulfonyl chloride 13360-57-1, Dimethylsulfamoyl chloride **39234-86-1**, 3,5-Bis(trifluoromethyl)benzenesulfonyl chloride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (sulfonamidation with trifluoromethanesulfonamide; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-43-6P**
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (surface catalyst for silica; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- IT **220431-26-5P**
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (Diels-Alder catalyst; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)
- RN 220431-26-5 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[S-phenyl-N-[S-phenyl-N-[(trifluoromethyl)sulfonyl)sulfonimidoyl)sulfonimidoyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

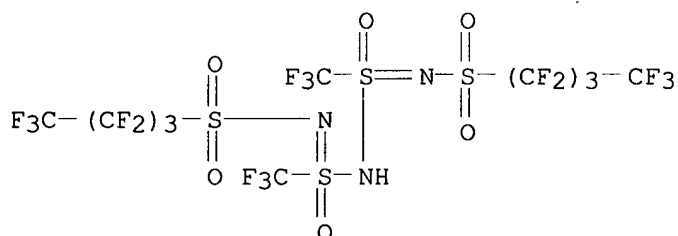
IT 220431-45-8P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(acidic isomerization catalyst; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 220431-45-8 HCAPLUS

CN 1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-[N-[N-[(nonafluorobutyl)sulfonyl]-S-(trifluoromethyl)sulfonimidoyl]-S-(trifluoromethyl)sulfonimidoyl]- (9CI) (CA INDEX NAME)



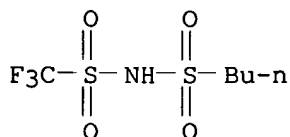
IT 210227-42-2P, N-[(Trifluoromethyl)sulfonyl]-1-butanesulfonamide potassium salt

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(chlorination and condensation with trifluoromethanesulfonamide; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 210227-42-2 HCAPLUS

CN 1-Butanesulfonamide, N-[(trifluoromethyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

IT 210227-20-6P

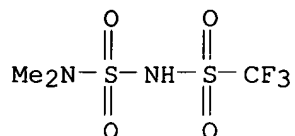
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

(Reactant or reagent)

(chlorination; preparation of delocalized anionic perfluorosulfonimide
derivs. as conductors and catalysts)

RN 210227-20-6 HCAPLUS

CN Methanesulfonamide, N-[(dimethylamino)sulfonyl]-1,1,1-trifluoro-,
potassium salt (9CI) (CA INDEX NAME)



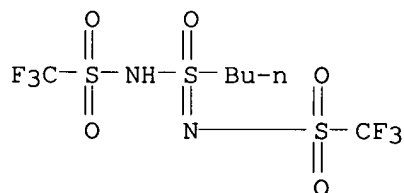
● K

IT 220431-08-3P

RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(conductivity in poly(ethylene oxide); preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 220431-08-3 HCAPLUS

CN Methanesulfonamide, N-[S-butyl-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-1,1,1-trifluoro-, lithium salt (9CI) (CA INDEX NAME)



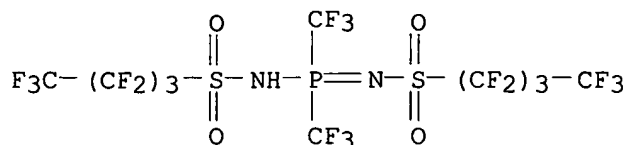
● Li

IT 220431-09-4P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(conductivity in solution; preparation of delocalized anionic
perfluorosulfonimide
derivs. as conductors and catalysts)

RN 220431-09-4 HCAPLUS

CN 1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-
[[[(nonafluorobutyl)sulfonyl]amino]bis(trifluoromethyl)phosphoranylidene]-
, lithium salt (9CI) (CA INDEX NAME)



● Li

IT 220431-46-9P

RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(conductivity; preparation of delocalized anionic perfluorosulfonimide derivs. as

conductors and catalysts)

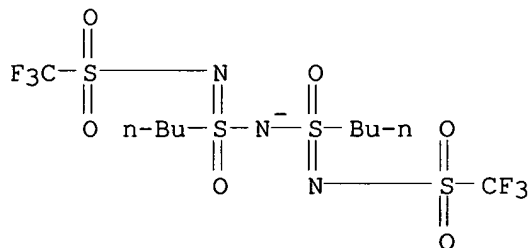
RN 220431-46-9 HCAPLUS

CN 1H-Imidazolium, 1-ethyl-3-methyl-, salt with N-[S-butyl-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-N'-[(trifluoromethyl)sulfonyl]-1-butanefulfonimidamide (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 220431-37-8

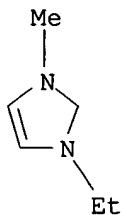
CMF C10 H18 F6 N3 O6 S4



CM 2

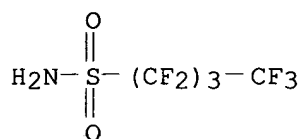
CRN 65039-03-4

CMF C6 H11 N2

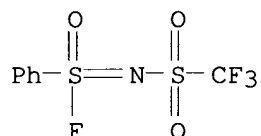


ONE OR MORE TAUTOMERIC DOUBLE BONDS NOT DISPLAYED IN THE STRUCTURE

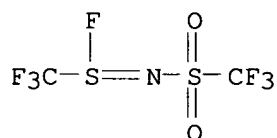
IT **30334-69-1**, Nonafluorobutanesulfonamide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (condensation with bis(trifluoromethyl)trichlorophosphorane; preparation of
 delocalized anionic perfluorosulfonimide derivs. as conductors and
 catalysts)
 RN 30334-69-1 HCAPLUS
 CN 1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro- (8CI, 9CI) (CA INDEX
 NAME)



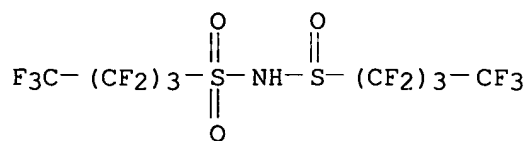
IT **156427-83-7**, N-(Trifluoromethylsulfonyl)phenylsulfonimidoyl
 fluoride **220431-05-0 220431-28-7**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (condensation with lithium nitride; preparation of delocalized anionic
 perfluorosulfonimide derivs. as conductors and catalysts)
 RN 156427-83-7 HCAPLUS
 CN Benzenesulfonimidoyl fluoride, N-[(trifluoromethyl)sulfonyl]- (9CI) (CA
 INDEX NAME)



RN 220431-05-0 HCAPLUS
 CN Methanesulfinimidoyl fluoride, 1,1,1-trifluoro-N-
 [(trifluoromethyl)sulfonyl]- (9CI) (CA INDEX NAME)

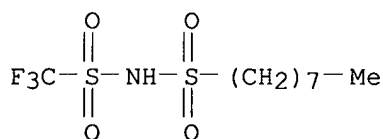


RN 220431-28-7 HCAPLUS
 CN 1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-
 [(nonafluorobutyl)sulfinyl]-, sodium salt (9CI) (CA INDEX NAME)



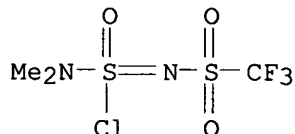
● Na

IT **220431-10-7P**, N-[(Trifluoromethyl)sulfonyl]-1-octanesulfonamide
 potassium salt **220431-30-1P**
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
 (Reactant or reagent)
 (condensation with lithium nitride; preparation of delocalized anionic
 perfluorosulfonimide derivs. as conductors and catalysts)
 RN 220431-10-7 HCAPLUS
 CN 1-Octanesulfonamide, N-[(trifluoromethyl)sulfonyl]-, potassium salt (9CI)
 (CA INDEX NAME)

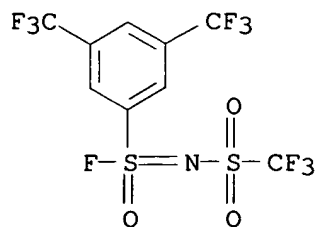


● K

RN 220431-30-1 HCAPLUS
 CN Imidosulfamoyl chloride, N,N-dimethyl-N'-[(trifluoromethyl)sulfonyl]-
 (9CI) (CA INDEX NAME)



IT **220431-14-1P**
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP
 (Preparation); RACT (Reactant or reagent)
 (condensation with malononitrile; preparation of delocalized
 anionic perfluorosulfonimide derivs. as conductors and catalysts)
 RN 220431-14-1 HCAPLUS
 CN Benzenesulfonimidoyl fluoride, 3,5-bis(trifluoromethyl)-N-
 [(trifluoromethyl)sulfonyl]- (9CI) (CA INDEX NAME)



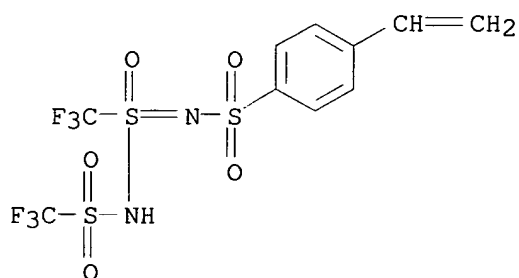
IT 220431-35-6P 220431-36-7P 220431-39-0P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(copolymn.; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 220431-35-6 HCAPLUS

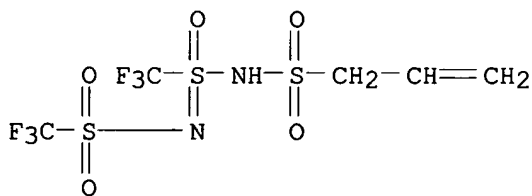
CN Benzenesulfonamide, 4-ethenyl-N-[S-(trifluoromethyl)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

RN 220431-36-7 HCAPLUS

CN 2-Propene-1-sulfonamide, N-[S-(trifluoromethyl)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)

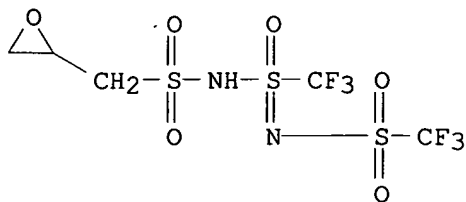


● K

RN 220431-39-0 HCAPLUS

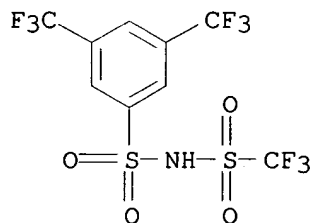
CN Oxiranemethanesulfonamide, N-[S-(trifluoromethyl)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)

[(trifluoromethyl)sulfonyl]sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

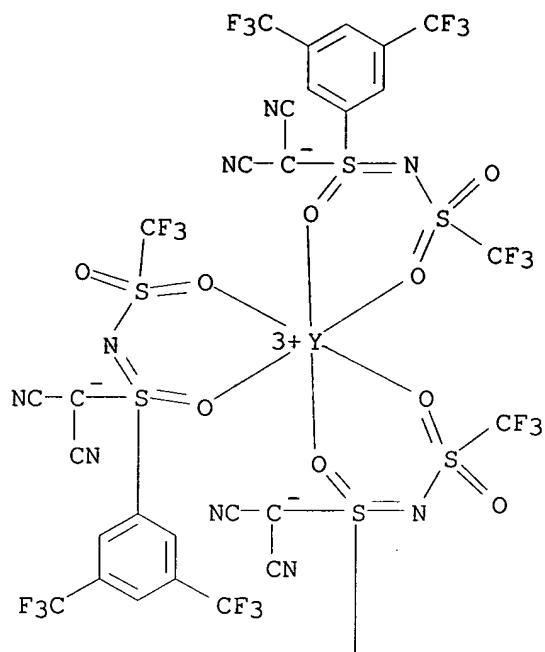
IT 220431-13-0P, 3,5-Bis(trifluoromethyl)-N-
[(trifluoromethyl)sulfonyl]benzenesulfonamide potassium salt
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT
(Reactant or reagent)
(fluorination; preparation of delocalized anionic perfluorosulfonimide
derivs. as conductors and catalysts)
RN 220431-13-0 HCAPLUS
CN Benzenesulfonamide, 3,5-bis(trifluoromethyl)-N-[(trifluoromethyl)sulfonyl]-
, potassium salt (9CI) (CA INDEX NAME)



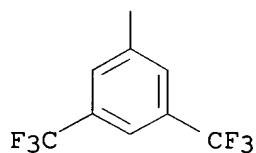
● K

IT 220430-60-4P 220430-66-0P 220431-16-3P
220431-17-4DP, rare earth salts
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);
USES (Uses)
(multi-reaction catalyst; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)
RN 220430-60-4 HCAPLUS
CN Yttrium, tris[[S-[3,5-bis(trifluoromethyl)phenyl]-N-
[(trifluoromethyl)sulfonyl-κO]sulfonimidoyl-
κO]propanedinitrilato]- (9CI) (CA INDEX NAME)

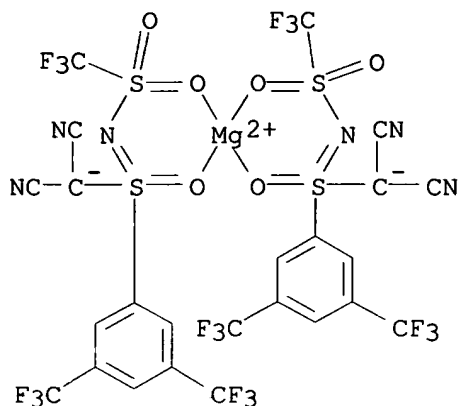
PAGE 1-A



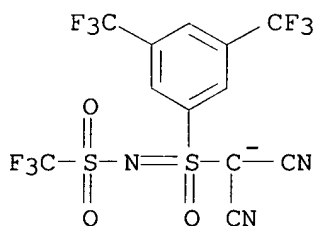
PAGE 2-A



RN 220430-66-0 HCAPLUS
 CN Magnesium, bis[[S-[3,5-bis(trifluoromethyl)phenyl]-N-
 [(trifluoromethyl)sulfonyl-κO]sulfonimidoyl-
 κO]propanedinitrilato]-, (T-4)- (9CI) (CA INDEX NAME)

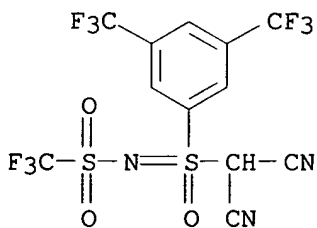


RN 220431-16-3 HCAPLUS
 CN Propanedinitrile, [S-[3,5-bis(trifluoromethyl)phenyl]-N-
 [(trifluoromethyl)sulfonyl]sulfonimidoyl]-, ion(1-), lithium (9CI) (CA
 INDEX NAME)



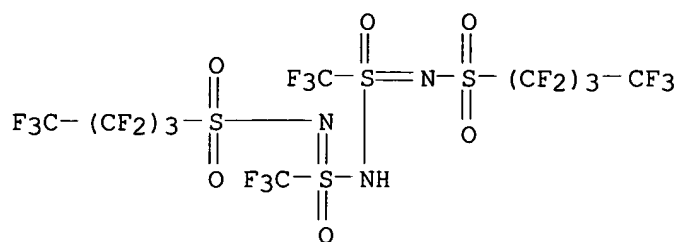
● Li⁺

RN 220431-17-4 HCAPLUS
 CN Propanedinitrile, [S-[3,5-bis(trifluoromethyl)phenyl]-N-
 [(trifluoromethyl)sulfonyl]sulfonimidoyl]- (9CI) (CA INDEX NAME)



IT 220431-44-7
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (neutralization; preparation of delocalized anionic perfluorosulfonimide
 derivs. as conductors and catalysts)
 RN 220431-44-7 HCAPLUS
 CN 1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-[N-[N-
 [(nonafluorobutyl)sulfonyl]-S-(trifluoromethyl)sulfonimidoyl]-S-

(trifluoromethyl)sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

IT 220431-41-4P

RL: MOA (Modifier or additive use); POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses) (polyelectrolyte; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

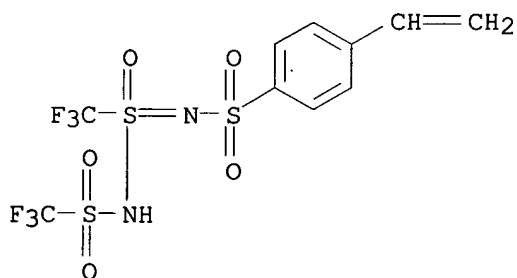
RN 220431-41-4 HCAPLUS

CN Methanesulfonamide, N-[N-[(4-ethenylphenyl)sulfonyl]-S-(trifluoromethyl)sulfonimidoyl]-1,1,1-trifluoro-, monolithium salt, polymer with oxirane and [(2-propenyloxy)methyl]oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 220431-40-3

CMF C10 H8 F6 N2 O5 S3 . Li

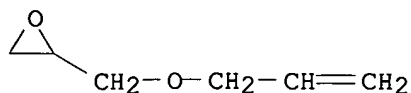


● Li

CM 2

CRN 106-92-3

CMF C6 H10 O2



CM 3

CRN 75-21-8

CMF C2 H4 O



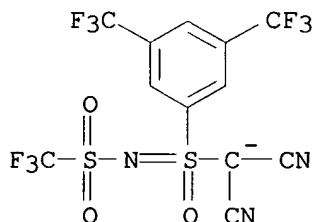
IT 220431-18-5P 220431-38-9P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);
USES (Uses)

(polymerization catalyst; preparation of delocalized anionic
perfluorosulfonimide derivs. as conductors and catalysts)

RN 220431-18-5 HCAPLUS

CN Propanedinitrile, [S-[3,5-bis(trifluoromethyl)phenyl]-N-
[(trifluoromethyl)sulfonyl]sulfonimidoyl]-, ion(1-), silver(1+) (9CI) (CA
INDEX NAME)



● Ag(I) +

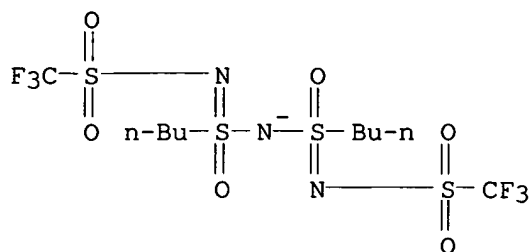
RN 220431-38-9 HCAPLUS

CN Iodonium, diphenyl-, salt with N-[S-butyl-N-[(trifluoromethyl)sulfonyl]sul-
fonimidoyl]-N'-[(trifluoromethyl)sulfonyl]-1-butanefulfonimidamide (1:1)
(9CI) (CA INDEX NAME)

CM 1

CRN 220431-37-8

CMF C10 H18 F6 N3 O6 S4



CM 2

CRN 10182-84-0

CMF C12 H10 I

Ph-I⁺ Ph

IT 220431-06-1P 220431-27-6P 220431-29-8P

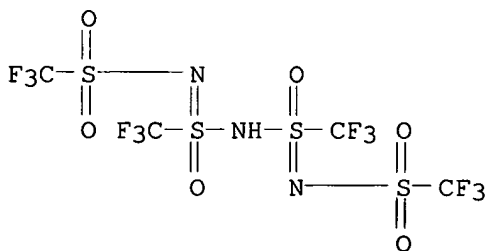
220431-31-2P 220431-34-5P 220431-47-0P

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of delocalized anionic perfluorosulfonimide derivs. as
conductors and catalysts)

RN 220431-06-1 HCAPLUS

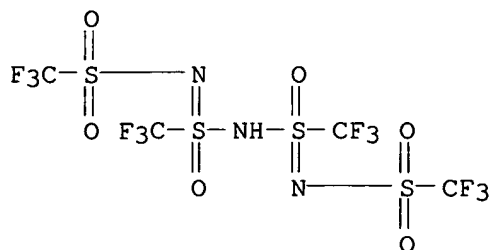
CN Methanesulfonamide, 1,1,1-trifluoro-N-[S-(trifluoromethyl)-N-[S-(trifluoromethyl)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]sulfonimidoyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

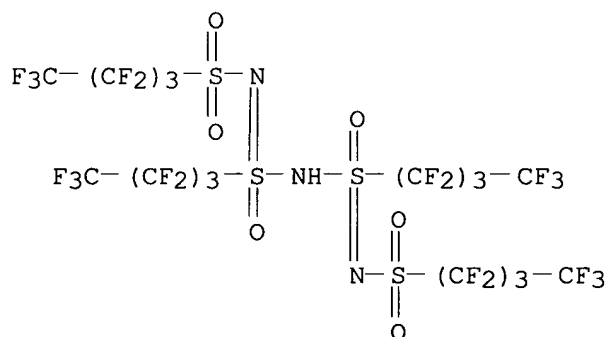
RN 220431-27-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[S-(trifluoromethyl)-N-[S-(trifluoromethyl)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)



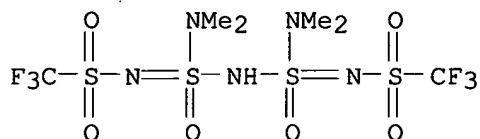
● K

RN 220431-29-8 HCAPLUS
 CN 1-Butanesulfonimidamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-[S-(nonafluorobutyl)-N-[(nonafluorobutyl)sulfonyl]sulfonimidoyl]-N'-[(nonafluorobutyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

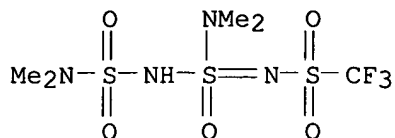
RN 220431-31-2 HCAPLUS
 CN Methanesulfonamide, N-[S-(dimethylamino)-N-[S-(dimethylamino)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-1,1,1-trifluoro-, potassium salt (9CI) (CA INDEX NAME)



● K

RN 220431-34-5 HCAPLUS
 CN Methanesulfonamide, N-[S-(dimethylamino)-N-[(dimethylamino)sulfonyl]sulfonimidoyl]-1,1,1-trifluoro-, potassium salt (9CI) (CA INDEX NAME)

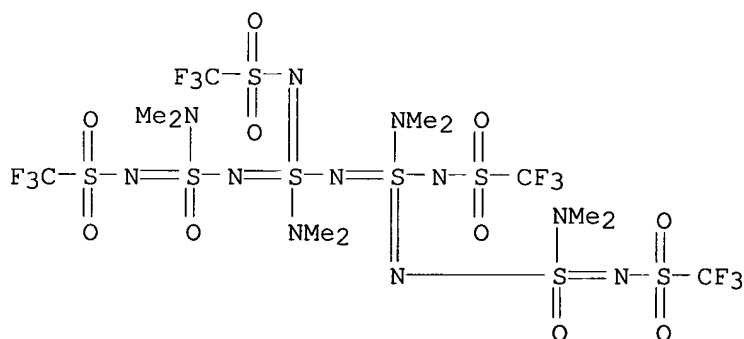
imidoyl]-1,1,1-trifluoro-, lithium salt (9CI) (CA INDEX NAME)



● Li

RN 220431-47-0 HCAPLUS

CN Tetraiminoimidodisulfamide, N,N,N',N'-tetramethyl-N''',N''''-bis{S-(dimethylamino)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-N''',N''''-bis[(trifluoromethyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

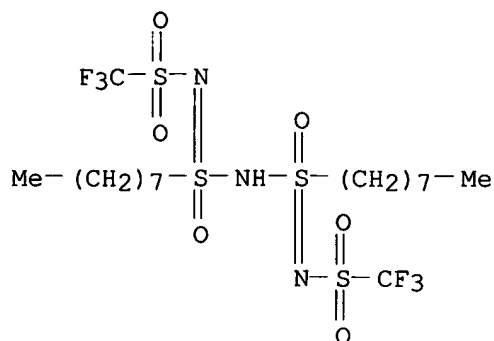
ONE OR MORE TAUTOMERIC DOUBLE BONDS NOT DISPLAYED IN THE STRUCTURE

IT 220431-12-9P

RL: MOA (Modifier or additive use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(properties; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 220431-12-9 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[S-octyl-N-[S-octyl-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]sulfonimidoyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

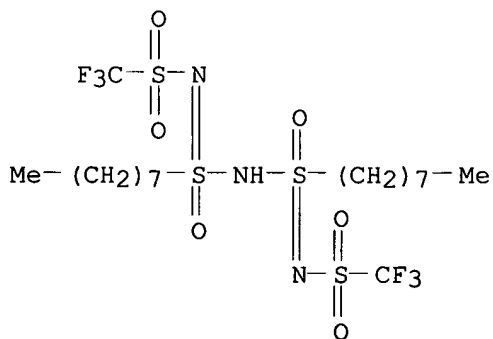
IT 220431-11-8P

RL: MOA (Modifier or additive use); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(salt conversion; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 220431-11-8 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[S-octyl-N-[S-octyl-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

IT 220431-07-2P 220431-15-2P 220431-25-4P

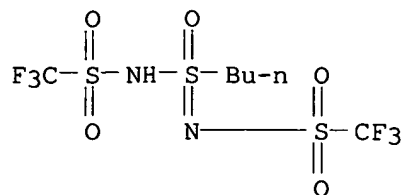
220431-32-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(salt conversion; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

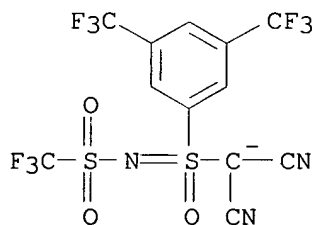
RN 220431-07-2 HCAPLUS

CN Methanesulfonamide, N-[S-butyl-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-1,1,1-trifluoro-, potassium salt (9CI) (CA INDEX NAME)



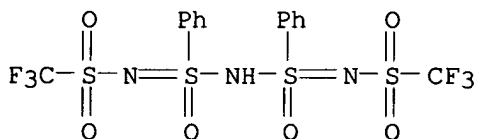
● K

RN 220431-15-2 HCAPLUS
 CN Propanedinitrile, [S-[3,5-bis(trifluoromethyl)phenyl]-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-, ion(1-), sodium (9CI) (CA INDEX NAME)



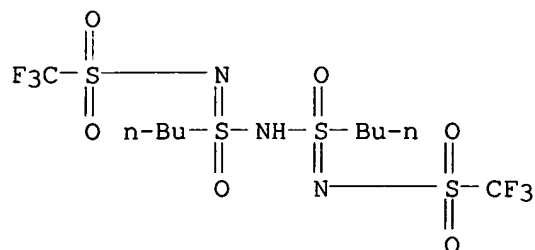
● Na⁺

RN 220431-25-4 HCAPLUS
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[S-phenyl-N-[S-phenyl-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]sulfonimidoyl]-, potassium salt (9CI) (CA INDEX NAME)



● K

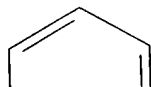
RN 220431-32-3 HCAPLUS
 CN Methanesulfonamide, N-[S-butyl-N-[S-butyl-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]sulfonimidoyl]-1,1,1-trifluoro-, potassium salt (9CI) (CA INDEX NAME)



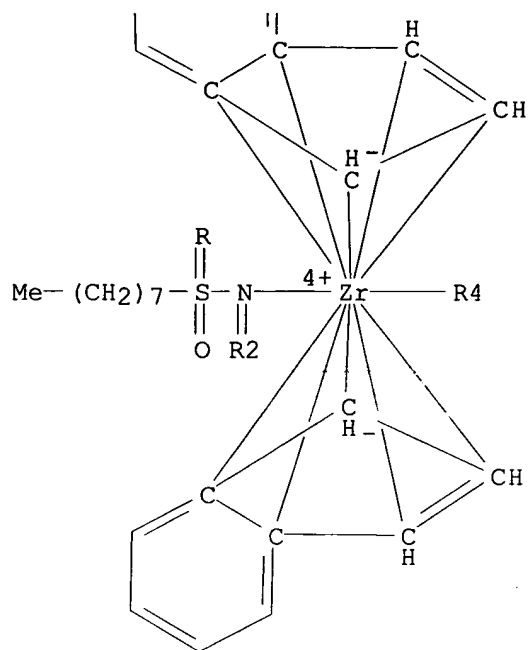
● K

IT 220430-58-0P
 RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation);
 PREP (Preparation); USES (Uses)
 (soluble **polymerization** catalyst; preparation of delocalized anionic
 perfluorosulfonimide derivs. as conductors and catalysts)
 RN 220430-58-0 HCAPLUS
 CN Zirconium, bis[1,1,1-trifluoro-N-[S-octyl-N-[S-octyl-N-
 [(trifluoromethyl)sulfonyl]sulfonimidoyl]sulfonimidoyl-
 κN]sulfonamido]bis[(1,2,3,3a,7a-η)-1H-inden-1-yl]- (9CI) (CA
 INDEX NAME)

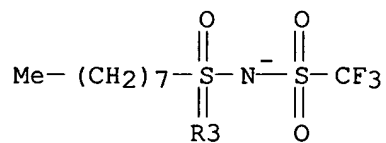
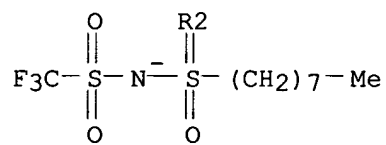
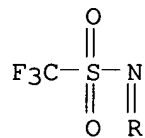
PAGE 1-A



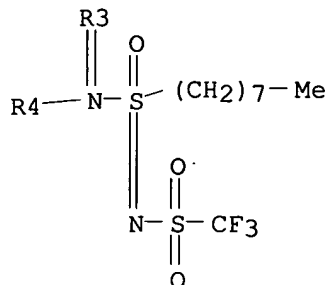
PAGE 2-A



PAGE 3-A



PAGE 4-A



IT 220431-42-5P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(solubility; preparation of delocalized anionic perfluorosulfonimide
derivs. as
conductors and catalysts)

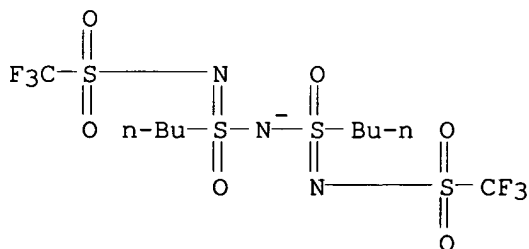
RN 220431-42-5 HCAPLUS

CN Benzothiazolium, 3-ethyl-2-[7-(3-ethyl-2(3H)-benzothiazolylydene)-1,3,5-
heptatrienyl]-, salt with N-[S-butyl-N-[(trifluoromethyl)sulfonyl]sulfonim
idoyl]-N'-[(trifluoromethyl)sulfonyl]-1-butanefulfonimidamide (1:1) (9CI)
(CA INDEX NAME)

CM 1

CRN 220431-37-8

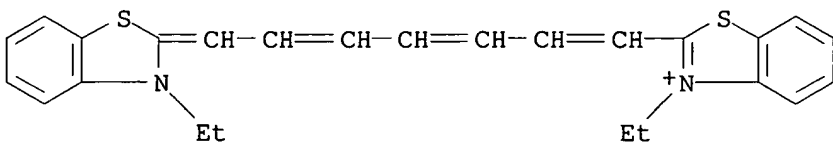
CMF C10 H18 F6 N3 O6 S4



CM 2

CRN 23178-68-9

CMF C25 H25 N2 S2



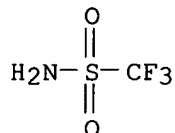
IT 421-85-2, Trifluoromethanesulfonamide

RL: RCT (Reactant); RACT (Reactant or reagent)

(sulfonamidation with butanesulfonyl chloride; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 421-85-2 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



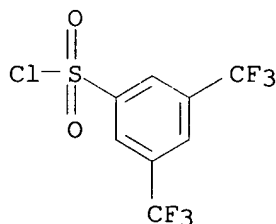
IT 39234-86-1, 3,5-Bis(trifluoromethyl)benzenesulfonyl chloride

RL: RCT (Reactant); RACT (Reactant or reagent)

(sulfonamidation with trifluoromethanesulfonamide; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 39234-86-1 HCAPLUS

CN Benzenesulfonyl chloride, 3,5-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



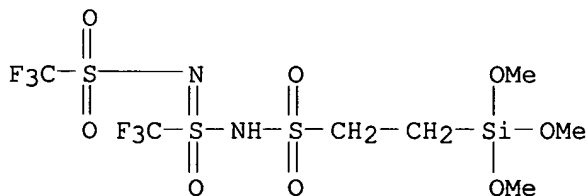
IT 220431-43-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(surface catalyst for silica; preparation of delocalized anionic perfluorosulfonimide derivs. as conductors and catalysts)

RN 220431-43-6 HCAPLUS

CN Ethanesulfonamide, N-[S-(trifluoromethyl)-N-[(trifluoromethyl)sulfonyl]sulfonimidoyl]-2-(trimethoxysilyl)-, potassium salt (9CI) (CA INDEX NAME)



● K

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 18 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

AN 1998:466331 HCAPLUS
 DN 129:136626
 TI Salts of pentacyclic or tetraazapentalene-based anions for use as ionic
 conductors
 IN Armand, Michel; Choquette, Yves; Gauthier, Michel; Michot, Christophe
 PA Centre National de la Recherche Scientifique (CNRS), Fr.; Hydro-Quebec
 SO Eur. Pat. Appl., 42 pp.
 CODEN: EPXXDW
 DT Patent
 LA French
 FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 850933	A1	19980701	EP 1997-403188	19971230
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	CA 2194127	AA	19980630	CA 1996-2194127	19961230
	CA 2199231	AA	19980905	CA 1997-2199231	19970305
	CA 2244979	AA	19980709	CA 1997-2244979	19971230
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	CA 2248304	AA	19980709	CA 1997-2248304	19971230
	WO 9829358	A2	19980709	WO 1997-CA1008	19971230
	WO 9829358	A3	19981008		
	W: CA, JP, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	WO 9829399	A1	19980709	WO 1997-CA1009	19971230
	W: CA, JP, US				
	WO 9829389	A1	19980709	WO 1997-CA1010	19971230
	W: CA, JP, US				
	WO 9829396	A1	19980709	WO 1997-CA1011	19971230
	W: CA, JP, US				
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	EP 890176	B1	20010620		
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	JP 2000508114	T2	20000627	JP 1998-529517	19971230
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	JP 2002514245	T2	20020514	JP 1998-529513	19971230
	EP 1391952	A2	20040225	EP 2003-292436	19971230
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	US 6120696	A	20000919	US 1998-125792	19980828
	US 6171522	B1	20010109	US 1998-101811	19981119
	US 6333425	B1	20011225	US 1998-101810	19981119
	US 6228942	B1	20010508	US 1998-125798	19981202
	US 6395367	B1	20020528	US 1998-125799	19981202
	US 6319428	B1	20011120	US 1998-125797	19981203

	US 6365068	B1	20020402	US 2000-609362	20000630
	US 6576159	B1	20030610	US 2000-638793	20000809
	US 2001024749	A1	20010927	US 2001-826941	20010406
	US 6506517	B2	20030114		
	US 2002009650	A1	20020124	US 2001-858439	20010516
	US 2002102380	A1	20020801	US 2002-107742	20020327
	US 6835495	B2	20041228		
	US 2003052310	A1	20030320	US 2002-253035	20020924
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	CA 1997-2199231	A	19970305		
	EP 1997-403188	A3	19971230		
	WO 1997-CA1008	W	19971230		
	WO 1997-CA1009	W	19971230		
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	US 2000-638793	A1	20000809		
	US 2001-858439	A1	20010516		
OS	MARPAT 129:136626				
GI	For diagram(s), see printed CA Issue.				
AB	Salts of metals, NO ⁺ , H ₃ O ⁺ , or NH ₄ ⁺ with the heterocycles I [Xi = N, C, S or P derivs. (but ≤4 X = N)] or II (Y = electron-withdrawing group of specified structure) are ionic conductors, useful i.a., as catalysts for polymerization and other reactions or as colorants. The reaction of 1 mol aminoguanidine bicarbonate with 1.05 mol CF ₃ CO ₂ H in PhMe with azeotropic distn of H ₂ O gave 92% 5-(trifluoromethyl)-1,3,4-triazole-2-amine, reaction of which with aqueous K ₂ CO ₃ gave 100% of the corresponding anion salt. Uses of the products in the above applications are exemplified.				
IC	ICM C07D249-04				
	ICS C07D233-90; C07D231-18; C07C255-46; C07D487-04; C07C317-44; C07F009-6584; C08G065-22; C08G077-04; C08F220-44; C09K003-00; H01M006-16; H01M010-40; C07B041-00; C08F004-00; C08J003-24				
ICI	C07D487-04, C07D249-00, C07D235-00				
CC	35-3 (Chemistry of Synthetic High Polymers) Section cross-reference(s): 28, 40, 67				
ST	ionic conductor heterocyclic; tetrazapentalene salt ionic conductor; triazine salt ionic conductor; polymn catalyst ionic conductor; trifluoromethyltriazineamine salt ionic conductor; aminoguanidine reaction trifluoroacetic acid				
IT	Battery electrolytes (anionic heterocycle salts as battery electrolytes)				
IT	Fireproofing agents Textiles (anionic pyrazole derivative polymers as fireproofing agents for Gore-Tex)				
IT	Crosslinking catalysts (anionic salts of heterocyclic compds. as crosslinking catalysts)				
IT	Conducting polymers (anionic salts of heterocyclic compds. as polymeric elec. conductors)				

IT **Polymerization** catalysts
(anionic salts of heterocyclic compds. as **polymerization** catalysts)

IT **Polymerization** catalysts
(photopolymn.; anionic imidazole salts as photopolymn. catalysts)

IT 210469-94-6P
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);
USES (Uses)
(preparation and use as **polymerization** catalyst)

IT **210289-59-1P**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(preparation as fireproofing agent for textiles)

IT **210289-54-6P**
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);
USES (Uses)
(preparation as photochem. **polymerization** catalyst)

IT **210289-48-8P**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(preparation for use as surfactant)

IT 709-62-6P **64139-67-9P** 156118-35-3DP, Dimethylsilanediol-
methylsilanediol copolymer, reaction products with
(difluorobutenyl)cyanotriazole 210289-24-0P 210289-27-3P
210289-38-6P 210289-52-4DP, reaction products with Me hydrogen
polysiloxanes
RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of)

IT **2926-27-4**, Potassium trifluoromethanesulfonate
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction with (trifluoromethyl)triazinediazonium salt)

IT 407-38-5P, 2,2,2-Trifluoroethyl trifluoroacetate **1648-99-3P**,
2,2,2-Trifluoroethanesulfonyl chloride 13360-57-1P, Dimethylsulfamoyl
chloride
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(reaction with dicyanoimidazole and benzoyl chloride)

IT **375-72-4**, Nonafluorobutanesulfonyl fluoride
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction with dicyanoimidazole and benzoyl chloride)

IT 110-61-2, **Succinonitrile**
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with hexafluoroacetylacetone)

IT 1522-22-1, 1,1,1,5,5,5-Hexafluoro-2,4-pentanedione
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with **succinonitrile**)

IT 77968-17-3
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with **succinonitrile** and Li hydride)

IT **210470-00-1**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction with thiopheneethanol)

IT **210289-29-5P 210289-30-8P 210289-31-9P**
210289-32-0P 210289-33-1P 210289-34-2P 210289-36-4P 210289-39-7P
210289-41-1P **210289-42-2P** 210289-43-3P **210289-44-4P**
210289-45-5P 210289-49-9P **210289-57-9P** 210289-62-6P
210469-88-8P 210469-89-9P 210469-95-7P **210469-97-9P**
210470-01-2P 210470-02-3P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)

(salts of pentacyclic or tetraazapentalene-based anions for use as ionic conductors)

IT **210469-91-3P**

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(salts of pentacyclic or tetraazapentalene-based anions for use as pH indicators in nonaq. media)

IT **210289-59-1P**

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(preparation as fireproofing agent for textiles)

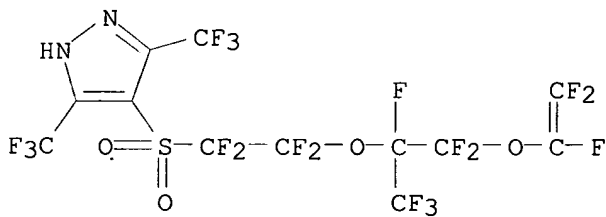
RN 210289-59-1 HCAPLUS

CN 1H-Pyrazole, 4-[[2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoroethyl]sulfonyl]-3,5-bis(trifluoromethyl)-, potassium salt, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 210289-57-9

CMF C12 H F19 N2 O4 S . K



● K

IT **210289-54-6P**

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(preparation as photochem. **polymerization** catalyst)

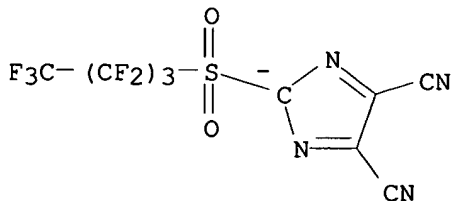
RN 210289-54-6 HCAPLUS

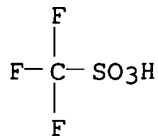
CN Iodonium, bis(4-dodecylphenyl)-, salt with 2-[(nonafluorobutyl)sulfonyl]-2H-imidazole-4,5-dicarbonitrile (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 210289-53-5

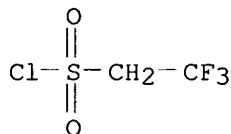
CMF C9 F9 N4 O2 S



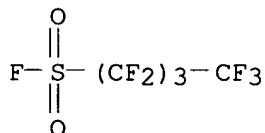


● K

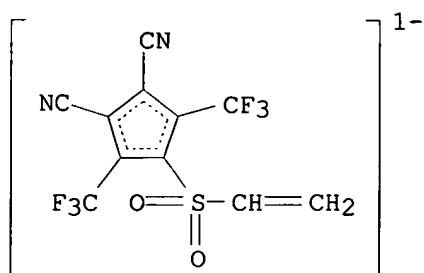
IT **1648-99-3P**, 2,2,2-Trifluoroethanesulfonyl chloride
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (reaction with dicyanoimidazole and benzoyl chloride)
 RN 1648-99-3 HCAPLUS
 CN Ethanesulfonyl chloride, 2,2,2-trifluoro- (7CI, 8CI, 9CI) (CA INDEX NAME)



IT **375-72-4**, Nonafluorobutanesulfonyl fluoride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction with dicyanoimidazole and benzoyl chloride)
 RN 375-72-4 HCAPLUS
 CN 1-Butanesulfonyl fluoride, 1,1,2,2,3,3,4,4,4-nonafluoro- (8CI, 9CI) (CA INDEX NAME)

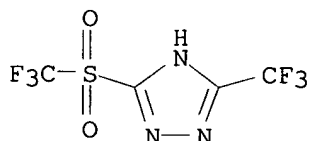


IT **210470-00-1**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction with thiopheneethanol)
 RN 210470-00-1 HCAPLUS
 CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-(ethenylsulfonyl)-3,5-bis(trifluoromethyl)-, ion(1-), potassium (9CI) (CA INDEX NAME)



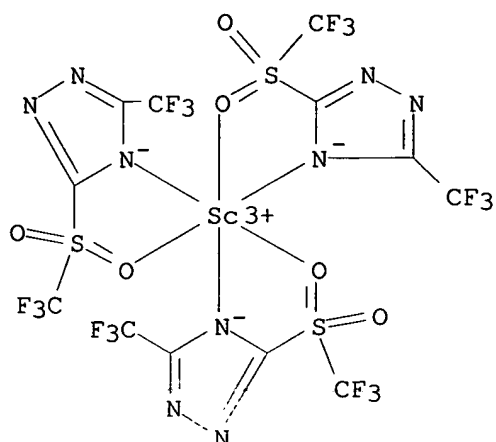
● K⁺

IT 210289-29-5P 210289-30-8P 210289-31-9P
 210289-42-2P 210289-44-4P 210289-57-9P
 210469-97-9P 210470-01-2P 210470-02-3P
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (salts of pentacyclic or tetraazapentalene-based anions for use as ionic conductors)
 RN 210289-29-5 HCAPLUS
 CN 1H-1,2,4-Triazole, 3-[(trifluoromethyl)sulfonyl]-, potassium salt (9CI) (CA INDEX NAME)

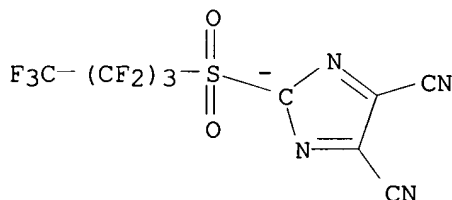


● K

RN 210289-30-8 HCAPLUS
 CN Scandium, tris[3-[(trifluoromethyl)sulfonyl-κO]-4H-1,2,4-triazolato-κN4]- (9CI) (CA INDEX NAME)

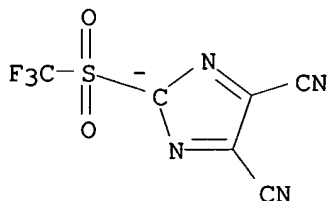


RN 210289-31-9 HCAPLUS
 CN 2H-Imidazole-4,5-dicarbonitrile, 2-[(nonafluorobutyl)sulfonyl]-, ion(1-),
 potassium (9CI) (CA INDEX NAME)



● K⁺

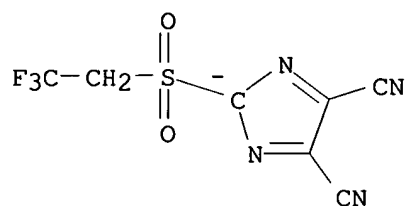
RN 210289-42-2 HCAPLUS
 CN 2H-Imidazole-4,5-dicarbonitrile, 2-[(trifluoromethyl)sulfonyl]-, ion(1-),
 potassium (9CI) (CA INDEX NAME)



● K⁺

RN 210289-44-4 HCAPLUS
 CN 2H-Imidazole-4,5-dicarbonitrile, 2-[(2,2,2-trifluoroethyl)sulfonyl]-,

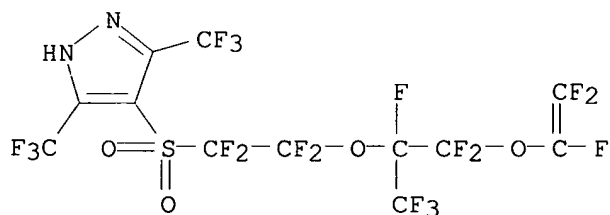
ion(1-), potassium (9CI) (CA INDEX NAME)



● K⁺

RN 210289-57-9 HCAPLUS

CN 1H-Pyrazole, 4-[[2-[1-[difluoro[(trifluoroethenyl)oxy]methyl]-1,2,2,2-tetrafluoroethoxy]-1,1,2,2-tetrafluoroethyl]sulfonyl]-3,5-bis(trifluoromethyl)-, potassium salt (9CI) (CA INDEX NAME)



● K

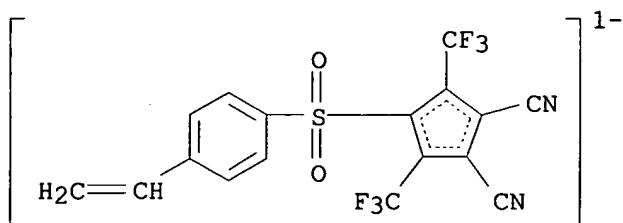
RN 210469-97-9 HCAPLUS

CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-[(4-ethenylphenyl)sulfonyl]-3,5-bis(trifluoromethyl)-, ion(1-), lithium, polymer with 2-propenenitrile (9CI) (CA INDEX NAME)

CM 1

CRN 210469-96-8

CMF C17 H7 F6 N2 O2 S . Li



● Li⁺

CM 2

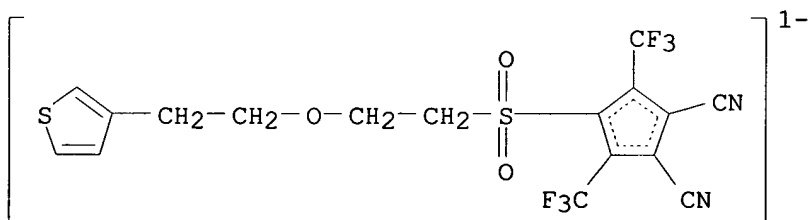
CRN 107-13-1

CMF C3 H3 N



RN 210470-01-2 HCAPLUS

CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-[[2-[2-(3-thienyl)ethoxy]ethyl]sulfonyl]-3,5-bis(trifluoromethyl)-, ion(1-), potassium (9CI) (CA INDEX NAME)



● K⁺

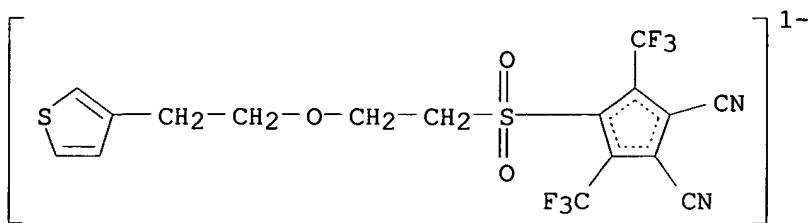
RN 210470-02-3 HCAPLUS

CN 1,3-Cyclopentadiene-1,2-dicarbonitrile, 4-[[2-[2-(3-thienyl)ethoxy]ethyl]sulfonyl]-3,5-bis(trifluoromethyl)-, ion(1-), potassium, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 210470-01-2

CMF C17 H11 F6 N2 O3 S2 . K



● K⁺

IT 210469-91-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(salts of pentacyclic or tetraazapentalene-based anions for use as pH indicators in nonaq. media)

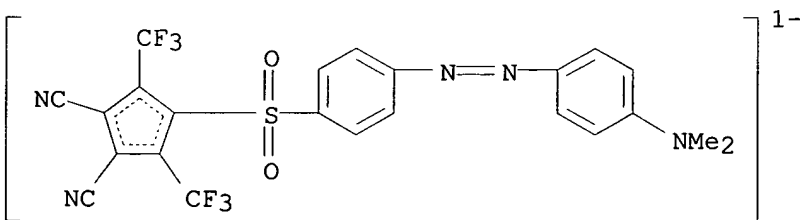
RN 210469-91-3 HCAPLUS

CN 1-Butanaminium, N,N,N-tributyl-, salt with 4-[[4-[[4-(dimethylamino)phenyl]azo]phenyl]sulfonyl]-3,5-bis(trifluoromethyl)-1,3-cyclopentadiene-1,2-dicarbonitrile (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 210469-90-2

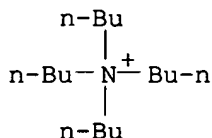
CMF C23 H14 F6 N5 O2 S



CM 2

CRN 10549-76-5

CMF C16 H36 N



RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

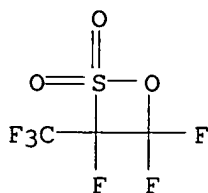
L51 ANSWER 19 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:464361 HCAPLUS
 DN 129:109417
 TI Salts of malononitrile-based anions for use as ionic conductors
 IN Armand, Michel; Choquette, Yves; Gauthier, Michel; Michot, Christophe
 PA Centre National de la Recherche Scientifique (CNRS), Fr.; Hydro-Quebec
 SO Eur. Pat. Appl., 49 pp.
 CODEN: EPXXDW
 DT Patent
 LA French
 FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 850921	A1	19980701	EP 1997-403189	19971230
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	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
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	CA 2199231	AA	19980905	CA 1997-2199231	19970305
	CA 2244979	AA	19980709	CA 1997-2244979	19971230
	CA 2248242	AA	19980709	CA 1997-2248242	19971230
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	CA 2248303	AA	19980709	CA 1997-2248303	19971230
	CA 2248304	AA	19980709	CA 1997-2248304	19971230
	WO 9829358	A2	19980709	WO 1997-CA1008	19971230
	WO 9829358	A3	19981008		
	W: CA, JP, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	WO 9829399	A1	19980709	WO 1997-CA1009	19971230
	W: CA, JP, US				
	WO 9829389	A1	19980709	WO 1997-CA1010	19971230
	W: CA, JP, US				
	WO 9829396	A1	19980709	WO 1997-CA1011	19971230
	W: CA, JP, US				
	WO 9829877	A1	19980709	WO 1997-CA1012	19971230
	W: CA, JP, US				
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	W: CA, JP, US				
	EP 889863	A2	19990113	EP 1997-951051	19971230
	EP 889863	B1	20030507		
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	EP 890176	A1	19990113	EP 1997-951052	19971230
	EP 890176	B1	20010620		
	R: DE, FR, GB, IT				
	JP 2000508114	T2	20000627	JP 1998-529517	19971230
	JP 2000508346	T2	20000704	JP 1998-529516	19971230
	JP 2000508676	T2	20000711	JP 1998-529514	19971230
	JP 2000508677	T2	20000711	JP 1998-529515	19971230
	JP 2000508678	T2	20000711	JP 1998-529518	19971230
	EP 1201650	A2	20020502	EP 2001-129670	19971230
	EP 1201650	A3	20040102		
	R: DE, FR, GB, IT				
	JP 2002514245	T2	20020514	JP 1998-529513	19971230
	US 6120696	A	20000919	US 1998-125792	19980828
	US 6171522	B1	20010109	US 1998-101811	19981119
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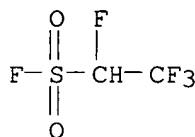
	US 6395367	B1	20020528	US 1998-125799	19981202
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	US 6365068	B1	20020402	US 2000-609362	20000630
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	US 2001024749	A1	20010927	US 2001-826941	20010406
	US 6506517	B2	20030114		
	US 2002009650	A1	20020124	US 2001-858439	20010516
	US 2002102380	A1	20020801	US 2002-107742	20020327
	US 6835495	B2	20041228		
	US 2003052310	A1	20030320	US 2002-253035	20020924
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	CA 1997-2199231	A	19970305		
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	WO 1997-CA1008	W	19971230		
	WO 1997-CA1009	W	19971230		
	WO 1997-CA1010	W	19971230		
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	WO 1997-CA1012	W	19971230		
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	US 1998-125797	A1	19981203		
	US 2000-638793	A1	20000809		
	US 2001-858439	A1	20010516		
OS	MARPAT 129:109417				
AB	The title compds., of specified structure and also useful as polymerization catalysts, colorants, etc., are prepared Stirring 10 mmol each stearoyl chloride and malononitrile K salt in THF at room temperature for 24 h, filtering, and stirring the filtrate with 500 mg Li ₂ CO ₃ for 24 h gave >97% Cl ₇ H ₃₅ COC(CN) ₂ - Li ⁺ . Use of the products in the above applications is exemplified.				
IC	ICM C07C317-44				
	ICS C07C255-17; C07C255-65; C07C255-27; C07C255-05; C07C255-35; C08F220-44; C07C255-31; C08G065-48; C08G073-06; C08G077-44; C08G073-02; C07F017-02; C07F007-18; C07C311-02; C09K003-00; H01M006-16; H01M010-40; C07B041-00; C08F004-00				
CC	35-3 (Chemistry of Synthetic High Polymers) Section cross-reference(s): 23, 40, 67				
ST	malononitrile deriv elec conductor; stearoylmalononitrile lithium salt; stearoyl chloride reaction malononitrile; polymn catalyst malononitrile deriv; coloring agent malononitrile deriv				
IT	Battery electrolytes (malononitrile derivative salts as battery electrolytes)				
IT	Crosslinking catalysts (malononitrile derivative salts as crosslinking catalysts)				
IT	Plasticizers (malononitrile derivative salts as plasticizers for polar polymers)				
IT	Conducting polymers (malononitrile derivative salts as polymeric conductors)				
IT	Polyelectrolytes (malononitrile derivative salts as polymeric electrolytes)				
IT	Polymerization catalysts (malononitrile derivative salts as polymerization catalysts)				
IT	Crosslinking catalysts				

- (photochem.; malononitrile derivative salts as **crosslinking** catalysts)
- IT **773-15-9**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (hydrolysis-decarboxylation)
- IT 937-14-4, 3-Chloroperoxybenzoic acid
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (peroxidn. of (allylsulfonyl)**malononitrile** K salt)
- IT **2127-74-4P**, 1,2,2,2-Tetrafluoroethanesulfonyl fluoride
 RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation and reaction with bromododecane and **malononitrile** Na salt)
- IT **210043-77-9P**
 RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation and reaction with **malononitrile**)
- IT 14418-84-9P, 2-Propenesulfonyl chloride 33939-62-7P
 RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation and reaction with **malononitrile** K salt)
- IT 210043-33-7P
 RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation and reaction with **malononitrile** Na salt)
- IT 1483-72-3, Diphenyliodonium chloride 2997-92-4 14635-75-7, Nitrosonium tetrafluoroborate 23178-68-9, 3,3'-Diethylthiatricarbocyanine
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with [[bis(ethylhexyl)amino]sulfonyl]**malononitrile** K salt)
- IT 13637-84-8, Chlorosulfonyl fluoride
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with bis(ethylhexyl)amine and **malononitrile** K salt)
- IT 106-20-7, Bis(2-ethylhexyl)amine
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with chlorosulfonyl fluoride and **malononitrile** K salt)
- IT 1120-71-4, 1,3-Propanesultone
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with lithiated phenazine and **malononitrile** K salt)
- IT 92-82-0, Phenazine
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with lithium, propanesultone and **malononitrile** K salt)
- IT 98-61-3, 4-Iodobenzenesulfonyl chloride 506-68-3, Cyanogen bromide
677-25-8, Ethenesulfonyl fluoride 2633-67-2
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with **malononitrile**)
- IT 67-42-5 81-88-9, Rhodamine B 112-76-5, Stearoyl chloride 401-99-0, 1,3-Dinitro-5-(trifluoromethyl)benzene 553-90-2, Dimethyl oxalate 700-16-3, Pentafluoropyridine 38870-89-2, Methoxyacetyl chloride 40724-67-2 53188-07-1, Trolox 56512-49-3 86688-96-2, 1H-Pyrrole-3-acetic acid 210043-94-0
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with **malononitrile** K salt)
- IT **375-72-4**, Nonafluorobutanesulfonyl fluoride 1293-87-4, 1,1'-Ferrocenedicarboxylic acid 2638-94-0, 4,4'-Azobis(4-cyanopentanoic acid) 21286-54-4 **29540-81-6** 39262-22-1
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)

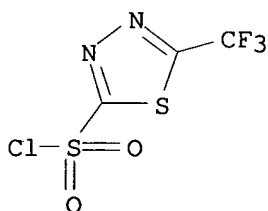
(reaction with **malononitrile** Li salt)
IT 7189-69-7, 1,1'-Sulfonyldiimidazole 10147-40-7, 1-Dodecanesulfonyl chloride
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with **malononitrile** Na salt)
IT 20334-42-3, **Malononitrile** sodium salt
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with polyethylene glycol sulfoalkyl ethers)
IT 81991-76-6, **Malononitrile** potassium salt
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with stearoyl chloride)
IT 109-77-3, **Malononitrile**
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with styrenesulfonyl chloride)
IT 78-08-0, Triethoxyvinylsilane 82985-35-1, Bis[3-trimethoxysilyl]propylamine
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with sulfur dioxide and **malononitrile** K salt)
IT 143-15-7, 1-Bromododecane
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(reaction with tetrafluoroethanesulfonyl fluoride and **malononitrile** Na salt)
IT 210043-40-6P
RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP (Preparation); RACT (Reactant or reagent)
(salts of **malononitrile**-based anions for use as ionic conductors)
IT 156118-35-3DP, Dimethylsilanediol-methylsilanediol copolymer, reaction products with (vinylsulfonyl)malononitrile Li salt 162134-09-ODP, reaction products with (tetrafluoroethyl)sulfonyl fluoride and malononitrile Na salt 210043-22-4P **210043-24-6P** 210043-26-8P
210043-30-4P 210043-31-5P 210043-32-6P 210043-34-8P 210043-35-9P
210043-36-0P 210043-38-2P 210043-39-3P 210043-43-9P 210043-46-2P
210043-47-3P 210043-51-9P 210043-52-0P 210043-55-3P 210043-56-4P
210043-57-5P 210043-58-6P 210043-60-0DP, reaction products with Me hydrogen polysiloxanes 210043-61-1P 210043-62-2P 210043-63-3P
210043-65-5P 210043-66-6P 210043-67-7P 210043-69-9P 210043-70-2P
210043-71-3P **210043-72-4P** 210043-74-6P 210043-76-8P
210043-78-0P **210043-79-1P** 210043-80-4P 210043-82-6P
210043-84-8P 210043-85-9P 210043-87-1P 210043-88-2P
210043-89-3P 210043-90-6P 210043-91-7P 210043-92-8P 210043-93-9P
210043-95-1P 210043-97-3P 210043-98-4P 210043-99-5P 210044-02-3P
210044-03-4P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(salts of malononitrile-based anions for use as ionic conductors)
IT 210043-64-4P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(salts of malononitrile-based anions for use as **polymerization** catalysts)
IT **773-15-9**
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrolysis-decarboxylation)
RN 773-15-9 HCAPLUS
CN 1,2-Oxathietane, 3,4,4-trifluoro-3-(trifluoromethyl)-, 2,2-dioxide (8CI, 9CI) (CA INDEX NAME)



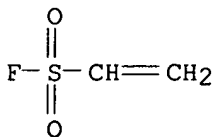
IT **2127-74-4P**, 1,2,2,2-Tetrafluoroethanesulfonyl fluoride
 RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation and reaction with bromododecane and **malononitrile** Na
 salt)
 RN 2127-74-4 HCAPLUS
 CN Ethanesulfonyl fluoride, 1,2,2,2-tetrafluoro- (6CI, 7CI, 8CI, 9CI) (CA
 INDEX NAME)



IT **210043-77-9P**
 RL: IMF (Industrial manufacture); **RCT (Reactant)**; PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation and reaction with **malononitrile**)
 RN 210043-77-9 HCAPLUS
 CN 1,3,4-Thiadiazole-2-sulfonyl chloride, 5-(trifluoromethyl)- (9CI) (CA
 INDEX NAME)



IT **677-25-8**, Ethenesulfonyl fluoride
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction with **malononitrile**)
 RN 677-25-8 HCAPLUS
 CN Ethenesulfonyl fluoride (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



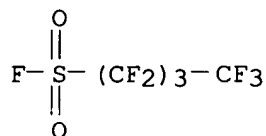
IT 375-72-4, Nonafluorobutanesulfonyl fluoride 29540-81-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(reaction with malononitrile Li salt)

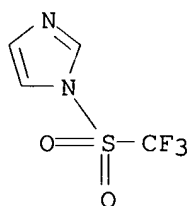
RN 375-72-4 HCAPLUS

CN 1-Butanesulfonyl fluoride, 1,1,2,2,3,3,4,4,4-nonafluoro- (8CI, 9CI) (CA INDEX NAME)



RN 29540-81-6 HCAPLUS

CN 1H-Imidazole, 1-[(trifluoromethyl)sulfonyl]- (9CI) (CA INDEX NAME)



IT 210043-24-6P 210043-72-4P 210043-78-0P

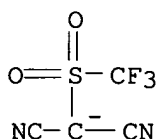
210043-79-1P 210043-84-8P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(salts of malononitrile-based anions for use as ionic conductors)

RN 210043-24-6 HCAPLUS

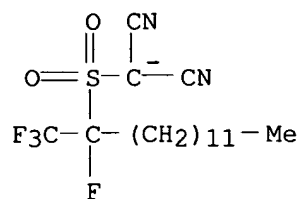
CN Propanedinitrile, [(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

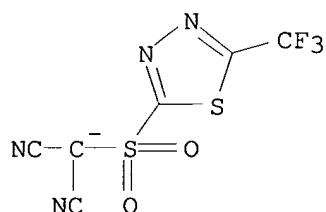
RN 210043-72-4 HCAPLUS

CN Propanedinitrile, [[1-fluoro-1-(trifluoromethyl)tridecyl)sulfonyl]-, ion(1-), potassium (9CI) (CA INDEX NAME)



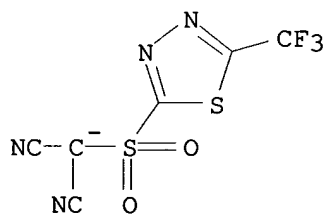
● K⁺

RN 210043-78-0 HCAPLUS
 CN Propanedinitrile, [[5-(trifluoromethyl)-1,3,4-thiadiazol-2-yl]sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

RN 210043-79-1 HCAPLUS
 CN Propanedinitrile, [[5-(trifluoromethyl)-1,3,4-thiadiazol-2-yl]sulfonyl]-, ion(1-), potassium (9CI) (CA INDEX NAME)



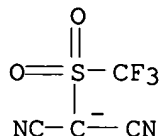
● K⁺

RN 210043-84-8 HCAPLUS
 CN 1H-Imidazolium, 1-ethyl-3-methyl-, salt with [(trifluoromethyl)sulfonyl]propanedinitrile (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 210043-83-7

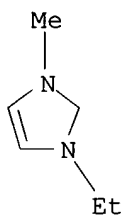
CMF C4 F3 N2 O2 S



CM 2

CRN 65039-03-4

CMF C6 H11 N2



ONE OR MORE TAUTOMERIC DOUBLE BONDS NOT DISPLAYED IN THE STRUCTURE
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 20 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:425987 HCAPLUS
DN 127:109378
TI **Polymerization** of cyclic ethers using selected metal compound
catalysts
IN Drysdale, Neville Everton
PA du Pont de Nemours, E. I., and Co., USA
SO U.S., 7 pp., Cont.-in-part of U.S. Ser. No. 331,305, abandoned.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 2

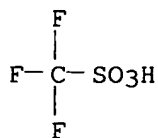
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5641853	A	19970624	US 1996-608340	19960228
	CN 1179786	A	19980422	CN 1995-195937	19951024
	CN 1092682	B	20021016		
	EP 1046663	A2	20001025	EP 2000-202233	19951024
	EP 1046663	A3	20010912		
	EP 1046663	B1	20030611		
	R: DE, ES, FR, GB, NL				
	ES 2180659	T3	20030216	ES 1995-938289	19951024
	ES 2200778	T3	20040316	ES 2000-202233	19951024
PRAI	US 1994-331305	B2	19941028		
	EP 1995-938289	A3	19951024		

OS MARPAT 127:109378

AB The title process comprises contacting, at -80° to +90°,
≥1 THF, oxepane, 1,3-dioxolane or 1,3,5-trioxane with MZsQr and, as

accelerator, a vinyl ester, R23PO2H, R23POHX, (R3O)3P, R23PX, or a **hexahalophosphonitrile trimer**. In the above formulas, R2 is H or (substituted) hydrocarbyl in which the substituent does not react with the starting materials or products and does not interfere with the **polymerization**; each R3 is independently (substituted) hydrocarbyl in which the substituent does not react with the starting materials or products and does not interfere with the **polymerization**; each X is independently Cl, Br, or I; M is strontium, barium, scandium, yttrium, the rare earth metals, titanium, zirconium, hafnium, chromium, molybdenum, tantalum, rhenium, iron, cobalt, vanadium, niobium, tungsten, ruthenium, osmium, rhodium, iridium, palladium, platinum, copper, silver, gold, zinc, cadmium, mercury, aluminum, gallium, indium, thulium, germanium, tin, mischmetal, lead, arsenic, antimony and bismuth; at least one of Z is a sulfo- and perfluoroalkyl-containing anion and remaining Z is oxo or ≥ 1 monovalent anion; s = 1-6 based on the metal; Q is a neutral ligand; t = 0-6. THF was **polymerized** using di-Et chlorophosphite and ytterbium triflate catalysts.

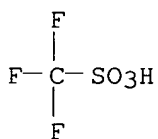
- IC ICM C08G065-16
ICS C08G065-20; C07C041-01; C07C041-16
- NCL 528233000
- CC 35-7 (Chemistry of Synthetic High Polymers)
- ST cyclic ether **polymn** metal catalyst; phosphorus compd accelerator **polymn**; polyoxyalkylene manuf metal catalyst
- IT **Polymerization**
 - Polymerization** catalysts
 (polymerization of cyclic ethers using selected metal compound catalysts)
- IT Polyoxyalkylenes, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (polymerization of cyclic ethers using selected metal compound catalysts)
- IT 94-04-2, Vinyl 2-Ethylhexanoate 108-05-4, Vinyl Acetate, uses 291-37-2, **Phosphonitrile trimer** 589-57-1, Diethyl Chlorophosphite 1707-03-5, Diphenylphosphinic Acid **34622-08-7**, Neodymium Triflate **52093-26-2**, Lanthanum Triflate **52093-30-8**, Yttrium Triflate **54761-04-5**, Ytterbium Triflate **62086-02-6** **88189-03-1** **89672-77-5** **139177-62-1**, Dysprosium Triflate **139177-64-3**, Erbium Triflate
 RL: CAT (Catalyst use); USES (Uses)
 (polymerization of cyclic ethers using selected metal compound catalysts)
- IT 24979-97-3P, THF homopolymer
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (polymerization of cyclic ethers using selected metal compound catalysts)
- IT **34622-08-7**, Neodymium Triflate **52093-26-2**, Lanthanum Triflate **52093-30-8**, Yttrium Triflate **54761-04-5**, Ytterbium Triflate **62086-02-6** **88189-03-1** **89672-77-5** **139177-62-1**, Dysprosium Triflate **139177-64-3**, Erbium Triflate
 RL: CAT (Catalyst use); USES (Uses)
 (polymerization of cyclic ethers using selected metal compound catalysts)
- RN 34622-08-7 HCAPLUS
- CN Methanesulfonic acid, trifluoro-, neodymium(3+) salt (9CI) (CA INDEX NAME)



●1/3 Nd(III)

RN 52093-26-2 HCAPLUS

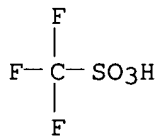
CN Methanesulfonic acid, trifluoro-, lanthanum(3+) salt (9CI) (CA INDEX NAME)



●1/3 La(III)

RN 52093-30-8 HCAPLUS

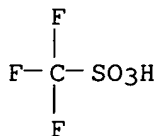
CN Methanesulfonic acid, trifluoro-, yttrium(3+) salt (9CI) (CA INDEX NAME)



●1/3 Y(III)

RN 54761-04-5 HCAPLUS

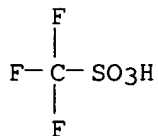
CN Methanesulfonic acid, trifluoro-, ytterbium(3+) salt (9CI) (CA INDEX NAME)



●1/3 Yb(III)

RN 62086-02-6 HCAPLUS

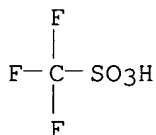
CN Methanesulfonic acid, trifluoro-, tin(4+) salt (9CI) (CA INDEX NAME)



●1/4 Sn(IV)

RN 88189-03-1 HCAPLUS

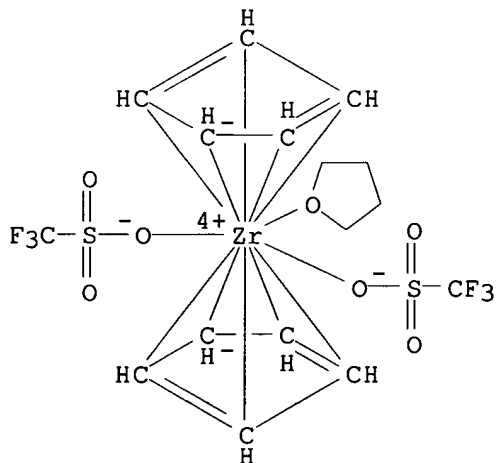
CN Methanesulfonic acid, trifluoro-, bismuth(3+) salt (9CI) (CA INDEX NAME)



●1/3 Bi(III)

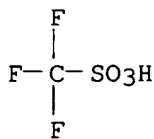
RN 89672-77-5 HCAPLUS

CN Zirconium, bis(η⁵-2,4-cyclopentadien-1-yl)(tetrahydrofuran)bis(trifluoromethanesulfonato-κO)-, stereoisomer (9CI) (CA INDEX NAME)



RN 139177-62-1 HCAPLUS

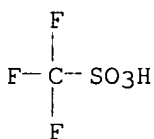
CN Methanesulfonic acid, trifluoro-, dysprosium(3+) salt (9CI) (CA INDEX NAME)



●1/3 Dy(III)

RN 139177-64-3 HCAPLUS

CN Methanesulfonic acid, trifluoro-, erbium(3+) salt (9CI) (CA INDEX NAME)



●1/3 Er(III)

L51 ANSWER 21 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:265565 HCAPLUS

DN 126:252329

TI Radiation-crosslinkable elastomers and acetophenone and benzoylphenone photocrosslinkers therefor

IN Stark, Peter A.; Stewart, Edward G.; Everaerts, Albert I.

PA Minnesota Mining and Manufacturing Co., USA

SO PCT Int. Appl., 34 pp.

CODEN: PIXXD2

DT Patent

LA English

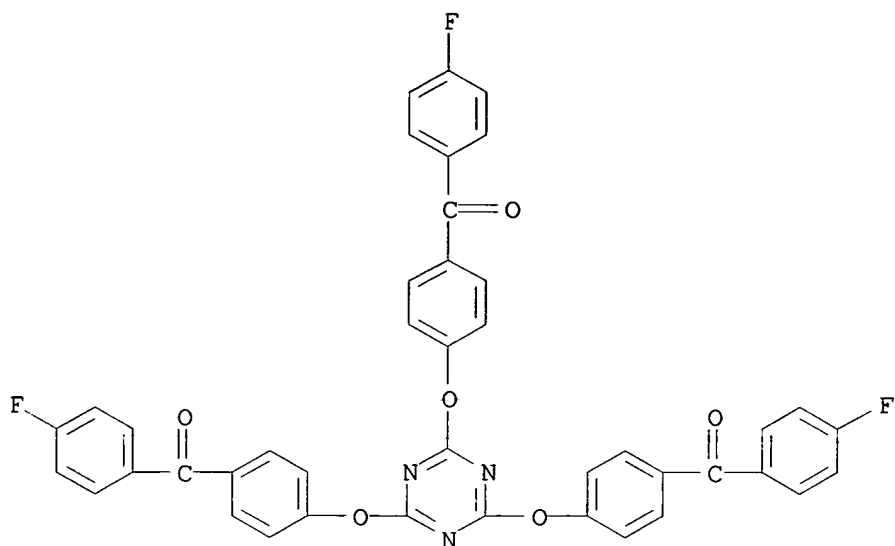
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	WO 9707161	A1	19970227	WO 1996-US13138	19960812
	W: AU, CA, JP, KR, MX				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	US 6369123	B1	20020409	US 1995-514677	19950814
	CA 2227542	AA	19970227	CA 1996-2227542	19960812
	AU 9667239	A1	19970312	AU 1996-67239	19960812
	EP 832156	A1	19980401	EP 1996-927411	19960812
	EP 832156	B1	20000322		
	R: BE, CH, DE, FR, GB, IT, LI, NL				
	JP 11501352	T2	19990202	JP 1996-509430	19960812
	JP 2974417	B2	19991110		
PRAI	US 1995-514677	A	19950814		
	WO 1996-US13138	W	19960812		

AB Radiation-crosslinkable elastomeric compns., useful as adhesives, coatings, sealants, etc., contain (a) an elastomeric **polymer** containing abstractable H atoms to enable the elastomeric **polymer** to crosslink in the presence of a radiation-activatable crosslinking agent;

and (b) a radiation-activatable crosslinking agent [XC(:O)p-C6H4W]nZ, where X is Me, (un)substituted Ph; W = O, NH, or S; Z is an organic spacer selected from aliphatic, aromatic, aralkyl, heteroarom., and cycloaliph. groups free of esters, amides, ketones, urethanes, and also free of ethers, thiols, allylic groups, and benzylic groups with H atoms intramol. accessible to the carbonyl group(s); and n ≥ 2. The polyfunctional acetophenones and benzophenones have decreased volatility and O sensitivity, increased compatibility, do not evolve toxic or corrosive byproducts, and can be used as post-curing crosslinking additives. Addnl., they are easily prepared from lower cost starting materials and have improved crosslink efficiency. 2,4,6-Tri(4-benzoylphenoxy)-1,3,5-triazine was prepared from 4-hydroxybenzophenone and cyanuric chloride and used (0.1 weight%) to cure a solvent-borne 5:95 acrylic acid-isooctyl acrylate copolymer adhesive system containing 0.05 weight% CBr4 on primed PET with 160 mJ/cm2 UV irradiation, giving peel strength (ASTM D 3330-87) 69.0 N/dm.

- IC ICM C08K005-3492
ICS C08K005-5399; C08K005-07; C08L021-00
- CC 39-10 (Synthetic Elastomers and Natural Rubber)
Section cross-reference(s): 38, 42
- IT 188578-94-1P **188578-99-6P**
RL: IMF (Industrial manufacture); PREP (Preparation)
(crosslinker; radiation-crosslinkable elastomers and acetophenone and benzoylphenone photocrosslinkers therefor)
- IT 52206-95-8P, 1,4-Bis(4-benzoylphenoxy)butane 64167-89-1P 84039-16-7P
142689-54-1P 188578-93-0P 188578-95-2P 188578-97-4P
188578-98-5P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(crosslinker; radiation-crosslinkable elastomers and acetophenone and benzoylphenone photocrosslinkers therefor)
- IT **108-77-0**, Cyanuric chloride 110-52-1, 1,4-Dibromobutane 111-24-0, 1,5-Dibromopentane 143-33-9, Sodium cyanide 623-24-5, 1,4-Bis(bromomethyl)benzene 626-15-3, 1,3-Bis(bromomethyl)benzene 1137-42-4, 4-Hydroxybenzophenone 4101-68-2, 1,10-Dibromodecane 4549-33-1, 1,9-Dibromononane 16422-79-0, **Phosphonitrile** chloride **trimer** 16696-65-4, 1,11-Dibromoundecane 25913-05-7, 4-**Fluoro**-4'-hydroxybenzophenone
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant in photocrosslinker preparation; radiation-crosslinkable elastomers and acetophenone and benzoylphenone photocrosslinkers therefor)
- IT **188578-99-6P**
RL: IMF (Industrial manufacture); PREP (Preparation)
(crosslinker; radiation-crosslinkable elastomers and acetophenone and benzoylphenone photocrosslinkers therefor)
- RN 188578-99-6 HCAPLUS
- CN Methanone, [1,3,5-triazine-2,4,6-triyltris(oxy-4,1-phenylene)]tris[(4-fluorophenyl)- (9CI) (CA INDEX NAME)]

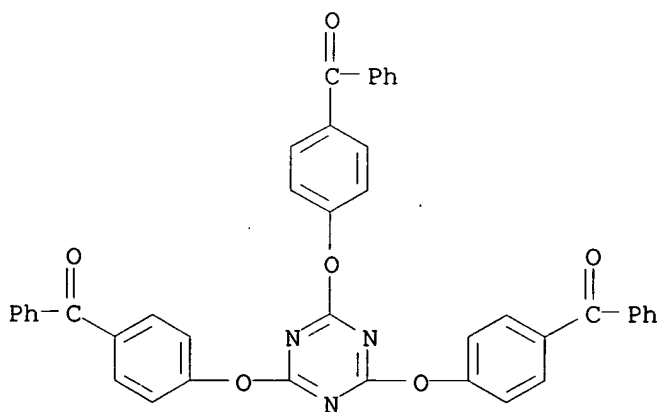


IT 188578-98-5P

RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(crosslinker; radiation-crosslinkable elastomers and acetophenone and benzoylphenone photocrosslinkers therefor)

RN 188578-98-5 HCAPLUS

CN Methanone, [1,3,5-triazine-2,4,6-triyltris(oxy-4,1-phenylene)]tris[phenyl- (9CI) (CA INDEX NAME)]

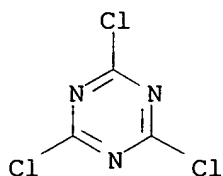


IT 108-77-0, Cyanuric chloride

RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant in photocrosslinker preparation; radiation-crosslinkable elastomers and acetophenone and benzoylphenone photocrosslinkers therefor)

RN 108-77-0 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-trichloro- (9CI) (CA INDEX NAME)

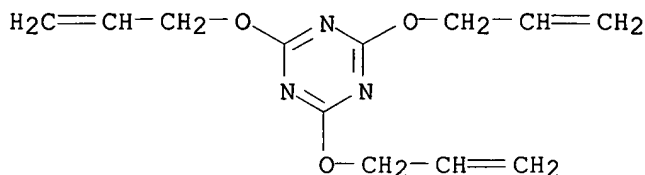


- L51 ANSWER 22 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1995:820024 HCAPLUS
 DN 123:233292
 TI Performance of differently cross-linked, partially **fluorinated** proton exchange **membranes** in **polymer electrolyte** fuel cells
 AU Buechi, Felix N.; Gupta, Bhuvanesh; Haas, Otto; Scherer, Guenther G.
 CS Laboratory for Energy and Process Technology, Paul Scherrer Inst., Villigen-PSI, CH-5232, Switz.
 SO Journal of the Electrochemical Society (1995), 142(9), 3044-8
 CODEN: JESOAN; ISSN: 0013-4651
 PB Electrochemical Society
 DT Journal
 LA English
 AB A series of differently cross-linked FEP-g-polystyrene proton exchange **membranes** has been synthesized by the preirradn. grafting method [FEP: poly(**tetrafluoroethylene-co-hexafluoropropylene**)]. Divinylbenzene (DVB) and/or triallyl cyanurate (TAC) were used as cross-linkers in the **membranes**. It was found that the phys. properties of the **membranes**, such as water-uptake and specific resistance, are strongly influenced by the nature of the crosslinker. Generally it can be stated that DVB decreases water-uptake and increases specific resistance; on the other hand TAC increases swelling and decreases specific resistance to values as low as 5.0 Ω cm at 60°. The **membranes** were tested in H₂/O₂ fuel cells for stability and performance. It was found that thick (170 μ m) DVB crosslinked **membranes** showed stable operation for 1400 h at temps. up to 80°. The highest power d. in the fuel cell was found for the DVB and TAC double-cross-linked **membrane**; it exceeded the value of a cell with a Nafion 117 **membrane** by more than 60%.
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38
 ST **fluorinated** proton exchange **membrane** fuel cell;
polymer electrolyte fuel cell
 IT Fuel-cell **electrolytes**
 (performance of differently cross-linked, partially **fluorinated** proton exchange **membranes** in **polymer electrolyte** fuel cells)
 IT 101-37-1, Triallyl cyanurate 1321-74-0, Divinylbenzene, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (cross-linker; performance of differently cross-linked, partially **fluorinated** proton exchange **membranes** in **polymer electrolyte** fuel cells)
 IT 125649-63-0D, sulfonated
 RL: DEV (Device component use); USES (Uses)
 (performance of differently cross-linked, partially **fluorinated** proton exchange **membranes** in **polymer electrolyte** fuel cells)
 IT 101-37-1, Triallyl cyanurate

RL: NUU (Other use, unclassified); USES (Uses)
 (cross-linker; performance of differently cross-linked, partially
fluorinated proton exchange **membranes** in
polymer electrolyte fuel cells)

RN 101-37-1 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(2-propenyloxy)- (9CI) (CA INDEX NAME)



L51 ANSWER 23 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:708842 HCAPLUS

DN 123:79014

TI Ion sensor

IN Yamashita, Koutarou; Taki, Mamoru; Miyahara, Yuji; Fujii, Toshiko; Ozawa, Satoshi; Watanabe, Yoshio

PA Hitachi, Ltd., Japan

SO Eur. Pat. Appl., 34 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	EP 661535	A1	19950705	EP 1994-119430	19941208
	R: DE, GB, NL				
	JP 07167825	A2	19950704	JP 1993-315080	19931215
	JP 07167826	A2	19950704	JP 1993-315081	19931215
	US 5472590	A	19951205	US 1994-354643	19941213
PRAI	JP 1993-315080	A	19931215		
	JP 1993-315081	A	19931215		

AB An ion sensor having an ion selectivity comprises an internal electrode of metal/metal salt, composed of an electroconductive layer of at least one metal and a layer of an insol. salt of the metal in contact with the electroconductive layer, an ion selective **membrane** whose supporting **membrane** is composed of a hydrophobic **polymer**, and an intermediate layer capable of keeping water mols. provided between the internal solid electrode and the ion selective **membrane**. The organic compound having a water-keeping property is polymethylene glycol, polyethylene glycol or polypropylene glycol, each having a mol. weight of 200-600. The inorg. compound having a water-keeping property is calcium chloride, gold chloride, magnesium perchlorate, magnesium **fluoride** or vanadium chloride dioxide. The ion sensor is suitable for anal. of specific ion species in a biol. fluid with practically prolonged maintenance of properties of the electrode.

IC ICM G01N027-333

ICS G01N027-414

CC 9-1 (Biochemical Methods)

Section cross-reference(s): 72, 76

IT Anions

Body fluid

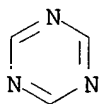
Cations

Electrodes

Electrolytes, biological

(ion sensor for body fluid anal.)

IT 56-81-5, Glycerol, analysis 57-14-7, N,N-Dimethylhydrazine 59-67-6, Pyridine-3-carboxylic acid, analysis 91-19-0, Quinoxaline 91-22-5, Quinoline, analysis 96-77-5, Phenol-2,4-disulfonic acid 107-21-1, Ethylene glycol, analysis 110-86-1, Pyridine, analysis 119-65-3, Isoquinoline 141-43-5, 2-Aminoethanol, analysis 260-94-6, Acridine 289-80-5, Pyridazine 290-37-9, Pyrazine **290-87-9**, s-Triazine 586-95-8, 4-Pyridinemethanol 626-03-9, 2,4-Pyridinediol 632-07-5, 2-Cyanopropionic acid 4358-26-3 5552-44-3, Diethyl pyridine-2,5-dicarboxylate 7447-40-7, Potassium chloride, analysis 7601-89-0, Sodium perchlorate 7647-14-5, Sodium chloride, analysis 7783-40-6, Magnesium **fluoride** 7785-23-1, Silver bromide 9002-89-5, Polyvinyl alcohol 9003-01-4D, Polyacrylic acid, salts 9004-32-4, Carboxymethylcellulose 9015-98-9, Polymethylene glycol 10034-81-8, Magnesium perchlorate 10043-52-4, Calcium chloride, analysis 11118-27-7, Gold chloride 13759-30-3, Vanadium chloride oxide (VClO₂) 13940-63-1, Germanium **difluoride** 25087-26-7D, Polymethacrylic acid, salts 25322-68-3, Polyethylene glycol 25322-69-4, Polypropylene oxide 50851-57-5D, Polystyrenesulfonic acid, salts
 RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
 (ion sensor for body fluid anal.)
 IT **290-87-9**, s-Triazine
 RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
 (ion sensor for body fluid anal.)
 RN 290-87-9 HCAPLUS
 CN 1,3,5-Triazine (9CI) (CA INDEX NAME)



L51 ANSWER 24 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1992:183474 HCAPLUS
 DN 116:183474
 TI Electrochemical synthesis of new **polymeric** reagents
 AU Tabakovic, R.; Gunic, E.; Tabakovic, I.; Zupan, M.
 CS Fac. Technol., Djuro Pucar Stari Univ., Banjaluka, 78000, Yugoslavia
 SO Electrochimica Acta (1992), 37(4), 751-5
 CODEN: ELCAAV; ISSN: 0013-4686
 DT Journal
 LA English
 AB **Crosslinked** poly[styrene-4-vinyl N-methylpyridinium iodide] (1Me-PVPI), poly[styrene-4-vinylpyridinium hydroiodide] (PVPPI) and derivs. were transformed to new **polymeric** reagents, differing in anions, by using a supporting **electrolyte** carrying the desired anion through anodic oxidation of the released iodide at a controlled potential. The exchange reaction was studied by means of electroanal. techniques. A new and simple electrochem. method for the synthesis of oxidizing, reducing, nucleophilic and acidic **polymeric** reagents is described.
 CC 72-4 (Electrochemistry)

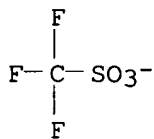
Section cross-reference(s): **35, 36**

- ST styrene vinylalkylpyridinium iodide electrooxidn counteranion replacement;
iodine generation **polymer** counter anion replacement; hydriodide
styrenevinylpyridinium **polymer** electrooxidn; anion exchange
iodide **polymer** synthesis electrooxidn
- IT Anion exchange
(in **polymer** electrochem. synthesis)
- IT Oxidation, electrochemical
(of iodide counterion of styrene-vinyl alkylpyridinium iodide copolymer
in acetonitrile with iodine generation in supporting
electrolyte with desired anion)
- IT 56-34-8, Tetraethylammonium chloride 733-44-8, Tetraethylammonium-p-
toluene sulfonate) 7789-23-3, Potassium fluoride (KF) 13755-29-8
35895-69-3, Tetraethylammonium trifluoromethane sulfonate
RL: PRP (Properties)
(electrochem. of **polymeric** reagents in organic solvent containing)
- IT 7553-56-2P, Iodine, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in electrochem. oxidation of iodide styrene vinyl alkyl
pyridinium iodide copolymer in acetonitrile containing supporting
electrolyte with desired anion)
- IT 140483-26-7 140483-27-8 140483-28-9
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(oxidation of, electrochem., iodine generation in, in **acetonitrile**
containing desired anion)
- IT 140483-26-7DP, ion-exchanged, **crosslinked** 140483-27-8DP,
ion-exchanged, **crosslinked** 140483-28-9DP, ion-exchanged,
crosslinked
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, by electrochem. oxidation of **polymer** with iodide
counterion in acetonitrile containing supporting **electrolyte** with
desired anion)
- IT **35895-69-3**, Tetraethylammonium trifluoromethane sulfonate
RL: PRP (Properties)
(electrochem. of **polymeric** reagents in organic solvent containing)
- RN 35895-69-3 HCAPLUS
- CN Ethanaminium, N,N,N-triethyl-, salt with trifluoromethanesulfonic acid
(1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 37181-39-8

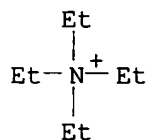
CMF C F3 O3 S



CM 2

CRN 66-40-0

CMF C8 H20 N



L51 ANSWER 25 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1991:617126 HCAPLUS

DN 115:217126

TI Controlled permeability of functionalized polypyrrole films by use of different **electrolyte** anion sizes in the electropolymerization step

AU Cosnier, S.; Deronzier, A.; Roland, J. F.

CS Lab. Electrochim. Org. Photochim. Redox, Univ. Joseph Fourier Grenoble 1, Grenoble, 38041, Fr.

SO Journal of Electroanalytical Chemistry and Interfacial Electrochemistry (1991), 310(1-2), 71-87

CODEN: JEIEBC; ISSN: 0022-0728

DT Journal

LA English

AB A series of electrodes modified by polypyrrole films substituted by a tris-bipyridine (e.g. (pyrrolylalkyl)methylbipyridine) ruthenium complex was prepared in CH₃CN in the presence of a large variety of **electrolytes** having different anion sizes. A further exchange of the former incorporated anion with perchlorate associated with the electrochem. destruction of the conductivity of the polypyrrole backbone leads to

modified electrodes exhibiting different behaviors toward the permeation of solutes like ferrocene and decamethylferrocene chosen as models. Utilization of toluenesulfonate or substituted toluenesulfonate with a long aliphatic chain as the supporting **electrolyte** in the **polymerization** media enhances markedly the permeability of the films with regard to modified electrodes prepared in a perchlorate **electrolyte**. In contrast, the incorporation of larger anions like anthraquinonesulfonate or naphthalenesulfonate increases the permeation of the films very little as a consequence of a lower ordered **polymeric** structure. The influence of other parameters such as the electropolymn. method and **crosslinking** degree of the **polymer** was also investigated.

CC 72-2 (Electrochemistry)
Section cross-reference(s): 29, 35, 36, 78

ST electropolymn ruthenium pyrrolylalkylmethylbipyridine complex anion effect; permeation ferrocene ruthenium **polymeric** complex; ferrocene permeation electrooxidn **polymer** coated thalium; anthraquinonesulfonate incorporation ruthenium **polymeric** complex; naphthalenesulfonate incorporation ruthenium **polymer** complex; electrode modified polypyrrole film ruthenium complex

IT Permeability and Permeation
(of ferrocene and decamethylferrocene by ruthenium(pyrrolylalkyl)methyl bipyridine **polymeric** complex prepared in presence of various anions on platinum)

IT Oxidation, electrochemical
(of ferrocene and decamethylferrocene on platinum modified with ruthenium(pyrrolylalkyl)methylbipyridine **polymeric** complex prepared in presence of various anions, permeation in relation to)

IT Surface structure
(of platinum electrode modified with ruthenium(pyrrolylalkyl)methylbipy

ridine **polymeric** complexes prepared in acetonitrile with various anions)

IT Anion exchange
(of ruthenium(pyrrolylalkyl)methylbipyridine **polymeric** complexes with various anions by perchlorate)

IT Electrodes
(platinum modified with ruthenium(pyrrolylalkyl)methylbipyridine or ruthenium bipyridine(pyrrolylalkyl)methylbipyridine **polymeric** complexes)

IT **Polymerization**
(electrochem., of ruthenium(pyrrolylalkyl)methylbipyridine and ruthenium bipyridine(pyrrolylalkyl)methylbipyridine complexes on platinum in acetonitrile containing various anions)

IT 1923-70-2
RL: PRP (Properties)
(electrochem. **polymerization** of ruthenium (pyrrolylalkyl)methylbipyridine complex on platinum in acetonitrile containing, permeation of ferrocene and decamethylferrocene in relation to)

IT 1330-69-4, Dodecylbenzenesulfonate anion 5776-56-7 14797-73-0, Perchlorate 16023-36-2 16722-51-3, p-Toluenesulfonate anion, uses and miscellaneous 37181-39-8
RL: PRP (Properties)
(electrochem. **polymerization** of ruthenium(pyrrolylalkyl)methylbipyridine complex on platinum in acetonitrile containing, controlled permeability in relation to)

IT 733-44-8, Tetraethylammonium p-toluenesulfonate 7182-86-7, Tetrabutylammonium p-toluenesulfonate
RL: PRP (Properties)
(electrochem. **polymerization** of ruthenium(pyrrolylalkyl)methylbipyridine complexes on platinum in acetonitrile containing)

IT 7440-06-4, Platinum, uses and miscellaneous
RL: USES (Uses)
(electrode, **polymerization** of ruthenium(pyrrolylalkyl)methylbipyridine and ruthenium bipyridine(pyrrolylalkyl)methylbipyridine complexes on, in acetonitrile containing various anions)

IT 102-54-5, Ferrocene 12126-50-0, Decamethylferrocene
RL: RCT (Reactant); RACT (Reactant or reagent)
(permeation and oxidation of, on platinum electrode modified with ruthenium(pyrrolylalkyl)bipyridine **polymeric** complex prepared in solution with various anions)

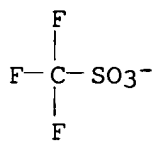
IT 136783-17-0 136783-18-1 **136783-19-2**
RL: PRP (Properties)
(platinum electrode modified with, permeation and oxidation of ferrocene and decamethylferrocene at, in acetonitrile)

IT 98587-97-4 136710-96-8
RL: **RCT (Reactant)**; RACT (Reactant or reagent)
(**polymerization** of, electrochem., on platinum in **acetonitrile** containing various anions, controlled permeability in relation to)

IT **37181-39-8**
RL: PRP (Properties)
(electrochem. **polymerization** of ruthenium(pyrrolylalkyl)methylbipyridine complex on platinum in acetonitrile containing, controlled permeability in relation to)

RN 37181-39-8 HCAPLUS

CN Methanesulfonic acid, trifluoro-, ion(1-) (9CI) (CA INDEX NAME)



IT 136783-19-2

RL: PRP (Properties)

(platinum electrode modified with, permeation and oxidation of ferrocene and decamethylferrocene at, in acetonitrile)

RN 136783-19-2 HCAPLUS

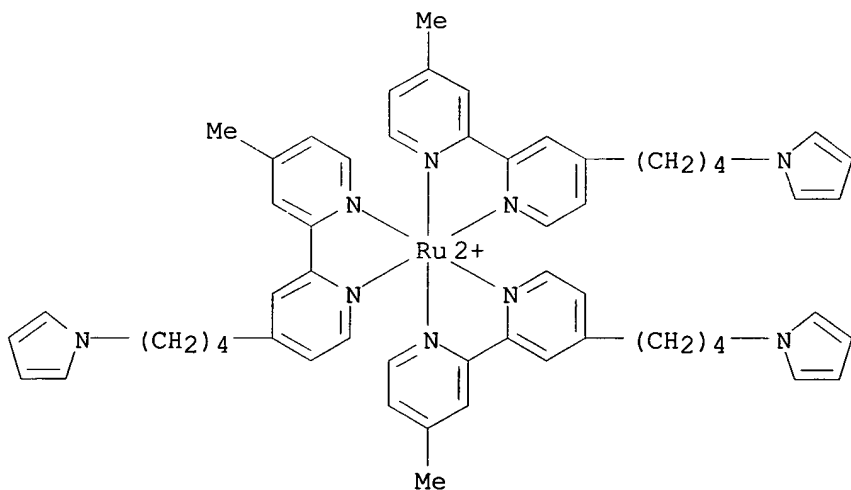
CN Ruthenium(2+), tris[4-methyl-4'-[4-(1H-pyrrol-1-yl)butyl]-2,2'-bipyridine-N1,N1']-, salt with trifluoromethanesulfonic acid (1:2), homopolymer (9CI)
(CA INDEX NAME)

CM 1

CRN 136710-96-8

CMF C57 H63 N9 Ru

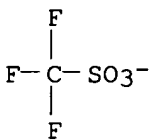
CCI CCS



CM 2

CRN 37181-39-8

CMF C F3 O3 S



AN 1991:531431 HCAPLUS
 DN 115:131431
 TI Preparation of surface-modified polyacrylonitrile substrates for isolation
 of biological material
 IN Chang, Laurence Wu Kwang; Anderson, Larry Stanley; Ley, David Arthur
 PA American Cyanamid Co., USA
 SO Eur. Pat. Appl., 21 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 397119	A2	19901114	EP 1990-108667	19900508
	EP 397119	A3	19911127		
	EP 397119	B1	19950913		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE				
	US 5082904	A	19920121	US 1990-507586	19900413
	CA 2016061	AA	19901108	CA 1990-2016061	19900504
	NO 9002014	A	19901109	NO 1990-2014	19900507
	NO 176181	B	19941107		
	NO 176181	C	19950215		
	KR 167756	B1	19990320	KR 1990-6535	19900507
	JP 03095236	A2	19910419	JP 1990-117003	19900508
	JP 2970926	B2	19991102		
	ES 2076988	T3	19951116	ES 1990-108667	19900508
	US 5194512	A	19930316	US 1991-738986	19910701
	US 5284911	A	19940208	US 1992-977989	19921118
	KR 175724	B1	19990515	KR 1998-29634	19980723
	JP 2000034358	A2	20000202	JP 1999-160874	19990608
	JP 3130301	B2	20010131		
PRAI	US 1989-349569	A	19890508		
	US 1990-507586	A	19900413		
	KR 1990-6535	A	19900507		
	JP 1990-117003	A3	19900508		
	US 1991-738986	A3	19910701		
AB	The title substrates comprise (a) a core of polyacrylonitrile or an acrylonitrile copolymer; and (b) a surface having evenly distributed (i) N-halo amide groups (or pendant bioactive ligands linked through N-halo amide groups) bound to the surface, and optionally, (ii) nitrile and-or amide groups. The surface-modified substrates are useful in isolation of biol. materials. Polyacrylonitrile beads bearing pendant amide groups were treated with diethyleneglycol and then with 2-fluoro-1- methylpyridinium toluene-4-sulfonate. Protein A was coupled to the product. The protein A beads bound .apprx.27.0 mg IgG/mL beads.				
IC	ICM C08F008-12 ICS B01J020-32; C12N011-08				
CC	9-14 (Biochemical Methods) Section cross-reference(s): 15				
ST	polyacrylonitrile substrate biol material isolation; biochem immobilization acrylonitrile polymer ; IgG isolation polyacrylonitrile protein A				
IT	Catalysts and Catalysis (alkaline, in preparation of acrylonitrile polymer -bioactive ligand conjugates)				
IT	Halogenation Reducing agents (in preparation of acrylonitrile polymer -bioactive ligand conjugates)				

- IT Peroxides, uses and miscellaneous
RL: SPN (Synthetic preparation); PREP (Preparation)
(in preparation of acrylonitrile **polymer**-bioactive ligand
conjugates)
- IT Enzymes
Nucleic acids
Peptides, analysis
Polysaccharides, analysis
Proteins, analysis
RL: SPN (Synthetic preparation); PREP (Preparation)
(isolation of, acrylonitrile **polymer**-bioactive ligand
conjugates preparation for)
- IT Immobilization, biochemical
(of bioactive ligand on acrylonitrile **polymer** derivs.)
- IT **Membranes**
(porous, surface-modified acrylonitrile **polymers** for)
- IT Dyes
Pigments
Agglutinins and Lectins
Antibodies
Antigens
Antitoxins
Haptens
Hormones
Toxins
RL: ANST (Analytical study)
(reaction products with acrylonitrile **polymer** derivs.)
- IT Proteins, specific or class
RL: ANST (Analytical study)
(A, reaction products, with acrylonitrile **polymer**
deriv.preparation of and IgG binding to)
- IT Alkenes, **polymers**
RL: ANST (Analytical study)
(C2-6, **polymers**, with acrylonitrile, reaction products with
bioactive ligands)
- IT Immunoglobulins
RL: PROC (Process)
(G, binding of, to protein A-acrylonitrile **polymer** derivative
resin)
- IT Chromatography, column and liquid
(affinity, stationary phases, biol. material isolation of,
acrylonitrile **polymer** derivative-bioactive ligand conjugates for)
- IT Transition metals, compounds
RL: ANST (Analytical study)
(complexes, reaction products with acrylonitrile **polymer**
derivs.)
- IT Vinyl compounds, **polymers**
RL: ANST (Analytical study)
(halo, **polymers**, with acrylonitrile, reaction products with
bioactive ligands)
- IT Nucleotides, **polymers**
RL: SPN (Synthetic preparation); PREP (Preparation)
(poly-, isolation of, acrylonitrile **polymer**-bioactive ligand
conjugates preparation for)
- IT Nucleotides, **polymers**
RL: ANST (Analytical study)
(poly-, reaction products, with acrylonitrile **polymer**
derivs.)
- IT Albumins, compounds

- RL: SPN (Synthetic preparation); PREP (Preparation)
(reaction products, with acrylonitrile **polymer** derivative, preparation of, as substrate)
- IT Carboxylic acids, compounds
Enzymes
Hydrazides
Nucleic acids
Peptides, compounds
Polysaccharides, compounds
Proteins, specific or class
Sulfonic acids, compounds
RL: ANST (Analytical study)
(reaction products, with acrylonitrile **polymer** derivs.)
- IT Quaternary ammonium compounds, compounds
RL: ANST (Analytical study)
(reaction products, with acrylonitrile **polymers**)
- IT Amides, compounds
Ligands
Nitriles, compounds
RL: SPN (Synthetic preparation); PREP (Preparation)
(reaction products, with acrylonitrile **polymers**, preparation of)
- IT Amines, compounds
RL: ANST (Analytical study)
(tertiary, reaction products, with acrylonitrile **polymer** derivs.)
- IT Amides, compounds
RL: SPN (Synthetic preparation); PREP (Preparation)
(N-halo, reaction products with acrylonitrile **polymers**, preparation of)
- IT 77-86-1 111-40-0, Diethylenetriamine 111-42-2, biological studies
111-46-6, Diethylene glycol, biological studies 112-27-6, Triethylene glycol 6291-84-5 24991-53-5, Polyoxyethylenediamine 30140-39-7, Hexanediamine 56-40-6, Glycine, biological studies 56-81-5, 1,2,3-Propanetriol, biological studies 60-32-2, 6-Aminocaproic acid 107-15-3, Ethylenediamine, biological studies 107-21-1, 1,2-Ethanediol, biological studies 107-95-9, β -Alanine 141-43-5, Ethanolamine, biological studies
RL: ANST (Analytical study)
(as bridging group in acrylonitrile **polymer**-bioactive ligand conjugates)
- IT 67-68-5, Dimethyl sulfoxide, biological studies 7722-84-1, Hydrogen peroxide, biological studies
RL: ANST (Analytical study)
(in preparation of acrylonitrile **polymer**-bioactive ligand conjugates)
- IT 102-71-6DP, reaction products with **polyacrylonitrile**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reaction of, for substrate preparation)
- IT 136023-51-3DP, reaction products with **polyacrylonitrile**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reaction of, in preparation of substrate)
- IT 9007-43-6DP, Cytochrome c, reaction products with acrylonitrile **polymer** derivative
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as substrate)
- IT 79-10-7DP, 2-Propenoic acid, alkyl derivs., Cl-6 hydroxyesters, bioactive ligands reaction products 79-41-4DP, alkyl derivs., Cl-6 hydroxyesters,

bioactive ligands reaction products 88-12-ODP, derivs., acrylonitrile copolymers, bioactive ligands reaction products 107-13-1DP, 2-Propenenitrile, **polymers**, bioactive ligands reaction products 3858-83-1DP, p-Aminobenzamidine, acrylonitrile **polymer** reaction products 9037-82-5DP, bioactive ligands reaction products 24968-79-4DP, Acrylonitrile-methyl acrylate copolymer, bioactive ligands reaction products 24980-62-9DP, Acrylonitrile-vinyl acetate copolymer, bioactive ligands reaction products 25014-41-9DP, Polyacrylonitrile, bioactive ligands reaction products 26660-38-8DP, Acrylonitrile-glycidylmethacrylate copolymer, bioactive ligands reaction products 39587-69-4DP, Acrylonitrile-glycidylacrylate copolymer, bioactive ligands reaction products 135899-16-0DP, bioactive ligands reaction products 135899-17-1DP, bioactive ligands reaction products
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of, for biol. materials isolation)

IT 100-36-7DP, N,N-Diethylethylenediamine, reaction products with polyacrylonitrile derivative 105-59-9DP, N-Methyldiethanolamine, reaction products with polyacrylonitrile derivative 124-09-4DP, 1,6-Hexanediamine, reaction products with polyacrylonitrile derivative **12236-82-7DP**, reaction products with polyacrylonitrile derivative
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of, for substrate preparation)

IT 74124-79-1
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction of, with **acrylonitrile polymer** derivative)

IT **58086-67-2**
 RL: **RCT (Reactant)**; RACT (Reactant or reagent)
 (reaction of, with **polyacrylonitrile** derivative beads)

IT **12236-82-7DP**, reaction products with polyacrylonitrile derivative
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of, for substrate preparation)

RN 12236-82-7 HCAPLUS

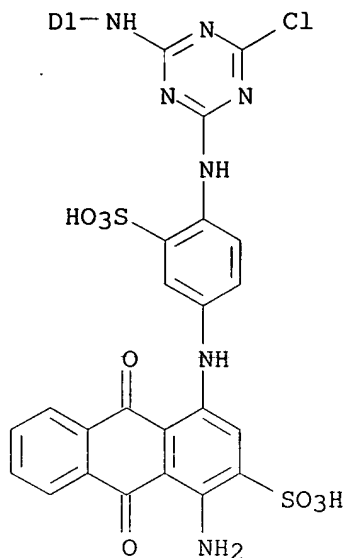
CN 2-Anthracenesulfonic acid, 1-amino-4-[[4-[[4-chloro-6-[[3(or 4)-sulfophenyl]amino]-1,3,5-triazin-2-yl]amino]-3-sulfophenyl]amino]-9,10-dihydro-9,10-dioxo- (9CI) (CA INDEX NAME)

PAGE 1-A



D1-SO₃H

PAGE 2-A



IT 58086-67-2

RL: RCT (Reactant); RACT (Reactant or reagent)

(reaction of, with **polyacrylonitrile** derivative beads)

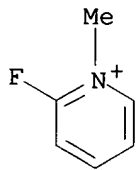
RN 58086-67-2 HCAPLUS

CN Pyridinium, 2-fluoro-1-methyl-, salt with 4-methylbenzenesulfonic acid (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 58086-66-1

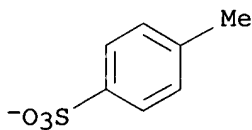
CMF C6 H7 F N



CM 2

CRN 16722-51-3

CMF C7 H7 O3 S



L51 ANSWER 27 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1982:617606 HCAPLUS

DN 97:217606

TI Ion-exchange **membranes**

IN Mas, Louis; Bernard, Michel; Chapiro, Adolphe; Bonamour, Anna Maria

PA Societe de Recherches Techniques et Industrielles S. A. (SRTI), Fr.

SO Fr. Demande, 11 pp.

CODEN: FRXXBL

DT Patent

LA French

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2494702	A1	19820528	FR 1980-24797	19801121
	FR 2494702	B1	19880304		
PRAI	FR 1980-24797		19801121		

AB The title **membranes**, useful in electrolysis cells, are prepared from grafted, crosslinked **fluoropolymers**. Thus, a 300- μ fabric of PTFE was irradiated with 0.12 Mrad gamma rays in air and immersed in a solution of acrylic acid 47.5, ethylene glycol dimethacrylate 5, and H₂O 47.5% at 60° until the degree of grafting was .apprx.10%. A **membrane** prepared from this graft **polymer** [83707-89-5] retained its mech. and elec. properties during 800 h immersion in 40% KOH at 200°.

IC C08J005-22; C08J007-18; C25B013-08

ICA C08F259-08

CC 38-3 (**Plastics** Fabrication and Uses)

Section cross-reference(s): 72

ST cation exchanger **membrane**; electrolysis cell **membrane**; **fluoropolymer** grafted **membrane**; PTFE grafted **membrane**; acrylic acid graft **fluoropolymer**; methacrylate ethylenedi graft **fluoropolymer**; graft **polymer** cation exchanger

IT **Electrolytic** cells

(**membranes** for, acrylic acid-grafted PTFE as)

IT **Polymerization**

(graft, radiochem., of acrylic compds. on PTFE)

IT Cation exchangers

(**membranes**, acrylic acid-grafted PTFE, for **electrolytic** cells)

IT **83707-88-4** 83707-89-5

RL: USES (Uses)

(graft, cation exchange **membranes**, for **electrolytic** cells)

IT **83707-88-4**

RL: USES (Uses)

(graft, cation exchange **membranes**, for **electrolytic** cells)

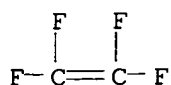
RN 83707-88-4 HCAPLUS

CN 2-Propenoic acid, polymer with tetrafluoroethene and 2,4,6-tris(2-propenyloxy)-1,3,5-triazine (9CI) (CA INDEX NAME)

CM 1

CRN 116-14-3

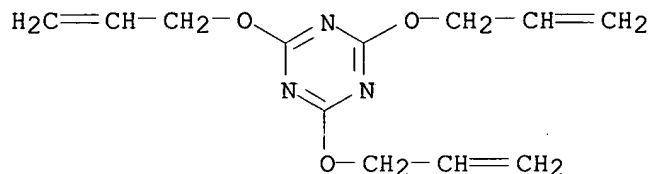
CMF C2 F4



CM 2

CRN 101-37-1

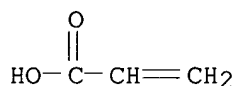
CMF C12 H15 N3 O3



CM 3

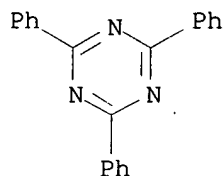
CRN 79-10-7

CMF C3 H4 O2



- L51 ANSWER 28 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1981:569885 HCAPLUS
 DN 95:169885
 TI Studies on conjugated **polymers**. VI. **Polymerization**
 of benzonitrile and benzyl cyanide
 AU Liu, Yu-Cheng; Jiang, Zhi-Gin; Xue, Jin-Zheng; Pan, Jin-Rvi
 CS Lanchow Univ., Lanchow, Peop. Rep. China
 SO Lanzhou Daxue Xuebao, Ziran Kexueban (1979), (1), 98-107
 CODEN: LCTHAF; ISSN: 0455-2059
 DT Journal
 LA Chinese
 AB **Polymerization** of benzyl cyanide [140-29-4] with BF₃ or TiCl₄ at
 200-300° gives polyphenylacetonitrile (I) [29323-90-8].
Cyclotrimerization of **benzonitrile** [100-47-0] in the
 presence of metal halides gives 2,4,6-triphenyl-s-triazine [
493-77-6]. At 350°, BF₃.C₆H₅OMe complex [456-31-5]
 induces the **polymerization** and trimerization of C₆H₅CN; the cyclic
 trimer then underwent ring-opening **polymerization** The mechanism of
polymerization of these 2 nitriles probably involved the intermediate
 stage of the cyclic trimer. I had elec. conductivity 10⁻⁹ Ω⁻¹ cm⁻¹ and was
 semiconductive.
 CC 35-4 (Synthetic High **Polymers**)
 ST benzonitrile **polymn** catalyst boron complex; benzyl cyanide
polymn catalyst; anisole complex **polymn** catalyst;
 Friedel Craft catalyst **polymn**; semiconductor
 polyphenylacetonitrile; ring opening **polymn** phenyltriazine

IT **Polymerization** catalysts
(anisole-boron **trifluoride** complex, for benzonitrile)
IT **Polymerization** catalysts
(Friedel-Crafts, for benzyl cyanide)
IT Trimerization catalysts
(cyclo-, anisole-boron **trifluoride**, for benzonitrile)
IT **Polymerization**
(ring-opening, of triphenyltriazine)
IT 7550-45-0, uses and miscellaneous 7637-07-2, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for **polymerization** of benzyl cyanide)
IT 456-31-5
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for **trimerization** and **polymerization** of **benzonitrile**)
IT 100-47-0, reactions 140-29-4
RL: RCT (Reactant); RACT (Reactant or reagent)
(**polymerization** of, mechanism of)
IT **493-77-6P** 26809-03-0P 29323-90-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, catalysts for)
IT **493-77-6P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, catalysts for)
RN 493-77-6 HCAPLUS
CN 1,3,5-Triazine, 2,4,6-triphenyl- (9CI) (CA INDEX NAME)



L51 ANSWER 29 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1976:58684 HCAPLUS

DN 84:58684

TI Oligomerization of acrylonitrile

IN Mahan, John E.; Gardner, Lloyd E.

PA Phillips Petroleum Co., USA

SO U.S., 3 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

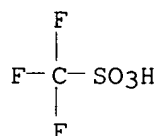
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3920722	A	19751118	US 1974-482255	19740624
PRAI	US 1974-482255	A	19740624		

AB Et3N (0.058 mole) was added to a chilled mixture of (F3CSO3)2Co 0.014 and inhibitor-free CH2:CHCN 0.76 mole and the mixture held 96 hr at 0° to give 53.3% NCCH2CH2C(:CH2)CN (I) and 10.3% CH2:C(CN)CH2CH(CN)(CH2)2CN (II). Similar treatment using (F3CSO3)2Zn instead of (F3CSO3)Co and a reaction temperature of 20° gave 57.2% I and 10.7% II.

IC C07C

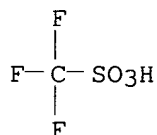
NCL 260465800D

CC 23-19 (Aliphatic Compounds)
 Section cross-reference(s): 35
 ST acrylonitrile dimerization catalyst; **trimerization**
acrylonitrile catalyst; methyleneglutaronitrile; glutaronitrile
 methylene; hexenetricarbonitrile
 IT **54010-75-2 58164-61-7**
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst from triethylamine and, for oligomerization of acrylonitrile)
 IT **54010-75-2 58164-61-7**
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst from triethylamine and, for oligomerization of acrylonitrile)
 RN 54010-75-2 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, zinc salt (9CI) (CA INDEX NAME)



● 1/2 Zn

RN 58164-61-7 HCAPLUS
 CN Methanesulfonic acid, trifluoro-, cobalt(2+) salt (9CI) (CA INDEX NAME)



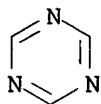
● 1/2 Co(II)

L51 ANSWER 30 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1973:419743 HCAPLUS
 DN 79:19743
 TI Triazines and crosslinked **polymers** or copolymers
 IN Emerson, William E.; Dorfman, Edwin
 PA Hooker Chemical Corp.
 SO U.S., 9 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3728344	A	19730417	US 1970-38651	19700522
	GB 1229054	A	19710421	GB 1968-1229054	19680417
	BE 714465	A	19681030	BE 1968-714465	19680430
PRAI	US 1967-634877	A	19670501		

AB Triazines were prepared from **perfluoroalkanonitriles** in high yields at low temps, and **polymers** containing >1 **cyanofluoroalkyl** group/mol. were crosslinked using amine oxides, their hydrochlorides or organometallic compds. as catalysts. Thus, a mixture of 3.56 parts **perfluorooctanonitrile** (I) [647-12-1] and 0.384 parts triphenyltin [892-20-6] was heated 20 hr at 160.deg. to give 100% tris(**perfluoroheptyl**)triazine (I) [21674-38-4]. I and 5% phenazine N-oxide [304-81-4] heated 20 hr at 190.deg. gave 100% II. A **perfluoroalkyltriazine polymer** containing 1-20 **cyanoperfluoropropyl** groups per 99-80 **perfluoropropyl** groups, resp., was mixed with .sim.5 weight % copper acetylacetonate [13395-16-9] and heated 97 hr at 150.deg. to form a crosslinked **polymer** insol. in hexane. Trimethylamine oxide hydrochloride [7651-88-9] (5%) gave the crosslinked **polymer** in 263 hr at 100.deg..

IC C07D
NCL 260248000CS
CC 36-6 (Plastics Manufacture and Processing)
ST **perfluorooctanonitrile** trimerization catalyst;
fluoroheptyltriazine polymer crosslinking catalyst; tin organo trimerization catalyst; phenazine oxide trimerization catalyst; copper triazine crosslinking catalyst; amine oxide hydrochloride catalyst
IT Organometallic compounds
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for **trimerization** of **perfluorooctanenitrile**)
IT Crosslinking catalysts
(organometallic compds., for **perfluoroalkyltriazine** derivative **polymers**)
IT **Trimerization** catalysts
(organometallic compds., for **perfluorooctanenitrile**)
IT 102-54-5 587-85-9 2155-73-9 4253-22-9 6752-41-6 7330-43-0
7529-22-8 7651-88-9 12084-29-6
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for crosslinking of **perfluoroalkyltriazine** derivative **polymers**)
IT 76-87-9 595-89-1 595-90-4 999-97-3 1112-56-7 3958-19-8
10210-68-1 12154-95-9 13395-16-9 15435-71-9 16091-18-2
17499-48-8
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for **trimerization** of **perfluorooctanenitrile**)
IT **290-87-9D**, 1,3,5-Triazine, **perfluoroalkyl** derivs., **polymers**
RL: RCT (Reactant); RACT (Reactant or reagent)
(crosslinking of, catalysts for)
IT **21674-38-4P**
RL: PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(manufacture of, catalysts for)
IT **290-87-9D**, 1,3,5-Triazine, **perfluoroalkyl** derivs., **polymers**
RL: RCT (Reactant); RACT (Reactant or reagent)
(crosslinking of, catalysts for)
RN 290-87-9 HCAPLUS
CN 1,3,5-Triazine (9CI) (CA INDEX NAME)

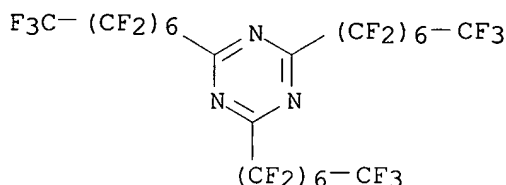


IT 21674-38-4P

RL: PEP (Physical, engineering or chemical process); PREP (Preparation);
PROC (Process)
(manufacture of, catalysts for)

RN 21674-38-4 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(pentadecafluoroheptyl)- (9CI) (CA INDEX NAME)



L51 ANSWER 31 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1970:67772 HCAPLUS

DN 72:67772

TI Catalytic conversion of haloalkane nitriles to triazines and its
application in the crosslinking of **polymers** or copolymers
containing cyanohaloalkyl groups

IN Emerson, William E.; Dorfman, Edwin

PA Hooker Chemical Corp.

SO Fr., 23 pp.

CODEN: FRXXAK

DT Patent

LA French

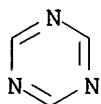
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 1574807	A	19690718	FR 1968-1574807	19680429
	GB 1229054	A	19710421	GB 1968-1229054	19680417
	BE 714465	A	19681030	BE 1968-714465	19680430
PRAI	US 1967-634877	A	19670501		

AB Triazines are prepared in improved yields by treating a perhaloalkane nitrile with a catalyst consisting of an organic amine oxide, an organometallic compound containing ≥ 1 metal-C bond, or a metal β -keto enolate. Thus, 3.56 parts **perfluorooctanonitrile** (I) was treated with 5 moles % dibutyltin distearate for 20 hr at 190° to give 100% tris(**perfluoroheptyl**)triazine (II), 53% conversion. II was similarly prepared from I by using e.g. Ph₄Pb, cupric acetylacetonate (III), phenazine N-oxide, Mn(CO)₅, hexamethyldisilazane, or ferrocenes. A **perfluoroalkylenetriazine polymer** containing 1-20% **cyanoperfluoropropyl** groups and 99-80% **perfluoropropyl** groups, resp., was heated 97 hr at 150° with 5% III to give a crosslinked **polymer** insol. in **hexafluoroxylene**. The post curing of the **polymer** improved its tensile strength.

IC C07D; C08F

CC 36 (**Plastics** Manufacture and Processing)
 ST triazines haloalkane nitriles; nitriles triazines haloalkane; haloalkane nitriles triazines; crosslinking **cyanoperfluoroalkyl polymers; cyanoperfluoroalkyl polymers** crosslinking; organotin catalysts crosslinking
 IT **Polymers**, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (cyanofluoroalkyl group-containing, crosslinking of)
 IT Crosslinking catalysts
 (for cyanofluoroalkyl group-containing polymers)
 IT **Trimerization** catalysts
 (for perfluoroalkyl nitriles)
 IT Ring closure
 (in trimerization of perfluoroalkyl nitriles)
 IT Crosslinking
 (of cyanofluoroalkyl group-containing polymers)
 IT Carbonyls
 RL: USES (Uses)
 (transition metal, catalysts, for trimerization of perfluoroalkyl nitriles)
 IT Mercury, dichloro- μ -1,1'-ferrocenyldiyl-di-
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for cyclotrimerization of perfluoroalkyl nitriles)
 IT 76-87-9 78-50-2 79-10-7D, Acrylic acid, tributylstannyl derivative
 102-54-5 123-54-6D, 2,4-Pentanedione, metal complexes 304-81-4
 563-25-7 595-89-1 597-64-8 688-73-3 994-31-0 999-97-3
 1112-56-7 1271-19-8 1271-55-2 1273-75-2 1291-32-3 1461-22-9
 3958-19-8 5847-55-2 10170-69-1 10210-68-1 12084-29-6 12154-95-9,
 Iron, di- μ -carbonyldicarbonyldi- π -cyclopentadienyldi-, (Fe-Fe)
 13007-92-6 13331-52-7 13395-16-9 13939-06-5 14040-11-0
 15435-71-9 16091-18-2 17499-48-8 20644-87-5, Vanadium carbonyl
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for cyclotrimerization of perfluoroalkyl nitriles)
 IT **290-87-9D**, s-Triazine, derivs., **polymers**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (crosslinking of, catalysts for)
 IT **21674-38-4P 290-87-9D**, s-Triazine, derivs.
 RL: PEP (Physical, engineering or chemical process); PREP (Preparation);
 PROC (Process)
 (manufacture of, catalysts for)
 IT **290-87-9D**, s-Triazine, derivs., **polymers**
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (crosslinking of, catalysts for)
 RN 290-87-9 HCAPLUS
 CN 1,3,5-Triazine (9CI) (CA INDEX NAME)

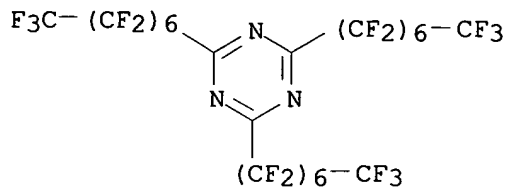


IT **21674-38-4P 290-87-9D**, s-Triazine, derivs.
 RL: PEP (Physical, engineering or chemical process); PREP (Preparation);
 PROC (Process)

(manufacture of, catalysts for)

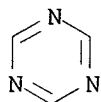
RN 21674-38-4 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(pentadecafluoroheptyl)- (9CI) (CA INDEX NAME)



RN 290-87-9 HCAPLUS

CN 1,3,5-Triazine (9CI) (CA INDEX NAME)



L51 ANSWER 32 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1970:13456 HCAPLUS

DN 72:13456

TI Triazines and crosslinked **polymers** or copolymers

IN Emerson, William E.; Dorfman, Edwin

PA Hooker Chemical Corp.

SO Fr., 15 pp.

CODEN: FRXXAK

DT Patent

LA French

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 1566876		19690509		
	GB 1229055			GB	
	US 3637629		19720000	US	
	US 3637630		19720000	US	
PRAI	US		19670501		

AB Triazines or crosslinked **polymers** or copolymers are prepared with high degree of conversion and high yield at low reaction temperature in the presence of at least 0.01% Ag salt, Group I, IIB, III, IV, VB, VI, VII, or VIII **fluoride**, NH₄F, and (or) their hydrates. Triazines are obtained by reacting at least 1 haloalkanenitrile with the catalyst at 70-200°. The hardened crosslinked **polymer** or copolymer is prepared by reacting at least 1 **polymer** or copolymer containing several nitrile groups/mol. with the catalyst at .apprx.190°. A composition containing the crosslinked **polymer** or copolymer and a charge, e.g., of carbon black, poly(**tetrafluoroethylene**), and (or) Mg silicate, is used as a stopping agent. Thus, 3.74 g **perfluorooctanonitrile** and 0.134 g AgCN were heated in a sealed Carius tube under N at 190° for 22.5 hr to give 3.2% tris(**perfluoroheptyl**)triazine. Other catalysts used were AgI, AgIO₃, AgNO₃, AgCl, AgF, SnF₂, CdF₂, TiF₃, CoF₂, TaF₅, FeF₂, GaF₃, VaF₄, NbF₅, CuF₂, ZnF₂.4H₂O, NaF₂, NH₄BF₄, AgBF₄, KF₂, NiF₂, SnF₄, ZrF₄, MnF₂, FeF₃,

CrF₂, KF, NaF, LiF, and AlF₃·3H₂O. Also prepared was tris(**perfluoropropyl**)triazine from **perfluorobutyronitrile**.

IC C07D; C08F

CC 36 (**Plastics** Manufacture and Processing)

ST crosslinked **cyanoperfluoroalkyl polymers**;
cyanoperfluoroalkyl polymers crosslinked;
perfluoroalkyl triazines; triazines **perfluoroalkyl**;
perfluoroalkanonitriles polymn; catalysts **polymn**
fluoro nitriles; nitriles catalysts **polymn**
fluoro; **fluoro nitriles** catalysts **polymn**

IT **Trimerization** catalysts
(metal **fluorides**, for **perfluorooctenonitrile**)

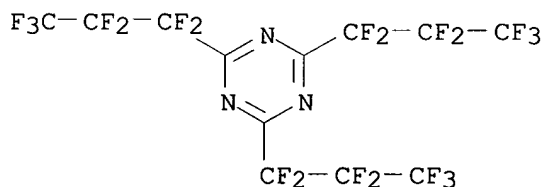
IT 506-64-9 1333-83-1 7681-49-4, uses and miscellaneous 7761-88-8, uses
and miscellaneous 7775-41-9 7782-64-1 7783-47-3 7783-50-8
7783-51-9 7783-62-2 7783-64-4 7783-68-8 7783-71-3 7783-90-6
7783-96-2 7783-97-3 7789-19-7 7789-23-3 7789-24-4, uses and
miscellaneous 7789-27-7 7789-28-8 7789-29-9 7790-79-6 10026-17-2
10028-18-9 10049-10-2 10049-16-8 13826-83-0 13986-18-0
14104-20-2 15098-87-0
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for **trimerization** of
perfluorooctanonitrile)

IT **915-76-4P 21674-38-4P**
RL: PREP (Preparation)
(manufacture of, metal catalysts for)

IT **915-76-4P 21674-38-4P**
RL: PREP (Preparation)
(manufacture of, metal catalysts for)

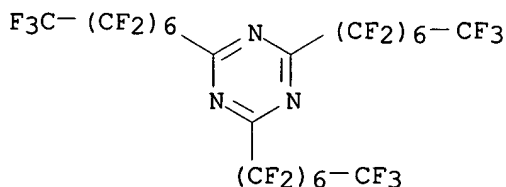
RN 915-76-4 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(heptafluoropropyl)- (9CI) (CA INDEX NAME)



RN 21674-38-4 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(pentadecafluoroheptyl)- (9CI) (CA INDEX NAME)



L51 ANSWER 33 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1969:524513 HCAPLUS

DN 71:124513

TI Catalyzed **nitrile trimerization**

IN Zollinger, Joseph L.
 PA Minnesota Mining and Manufacturing Co.
 SO U.S., 9 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3470176	A	19690930	US 1967-622038	19670310
PRAI	US 1967-622038	A	19670310		

AB Organometallic catalysts with the formula R_2R_1MO or $R_3M(OR)_n$ ($M = As, Sb,$ or Sn) are used under anhydrous conditions in the **trimerization** of **nitriles** or **polynitriles** to form s-triazines or triazine-linked **polymers**, resp. Thus, a 95% solution of Bu_3SbBr_2 was passed through the OH form of an anion-exchange resin and the solution was concentrated to give $Bu_3Sb(OH)_2$ (I). A mixture of 20 g. $C_5F_{11}CN$ (b. 53°) and 0.4 g. I was shaken in a stoppered flask at 23° for 24 hrs. and the mixture was distilled to give 85% 2,4,6-tris(**perfluoropentyl**)-s-triazine, b38 $151-2^\circ$, n23D 1.3160, d204 1.800. The preparation of similar **fluorinated**-alkyl-substituted s-triazines is described. $NC(CF_2)_8CN$, $O(CF_2CF_2CN)_2$, $NCCF_2CF_2O(CF_2)_4OCF_2CF_2CN$, $NC(CF_2CF_2OCF_2CF_2)_4CN$, and $C_2F_5OCF_2CF_2CN$ were used in the preparation of crosslinked transparent gels, resilient elastomers, and triazine rubber.

IC C07D

NCL 260248000

CC 28 (Heterocyclic Compounds (More Than One Hetero Atom))

ST **nitriles trimerization; trimerization**
nitriles; catalysts nitrile trimerization;
 triazines; **fluorine** contg triazines; **polymeric**
 triazines; organometallic catalysts

IT **Nitriles, reactions**

RL: RCT (Reactant); RACT (Reactant or reagent)
 (**perfluoro** aliphatic, **cyclotrimerization** of)

IT Trimerization catalysts
 (tributylidihydroxyantimony and tributylstibine oxide, for
cyclotrimerization of **perfluoro** aliphatic
nitriles)

IT 6752-41-6 23790-48-9

RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for **cyclotrimerization** of **perfluoro**
 aliphatic **nitriles**)

IT **368-66-1P 6542-67-2P 21674-38-4P**
23790-50-3P 24142-25-4P 25240-03-3P
25302-65-2P 25325-51-3P 25455-82-7P

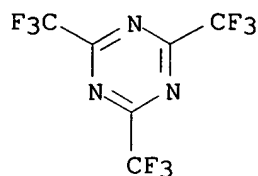
RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of)

IT **368-66-1P 6542-67-2P 21674-38-4P**
23790-50-3P 24142-25-4P 25240-03-3P
25325-51-3P 25455-82-7P

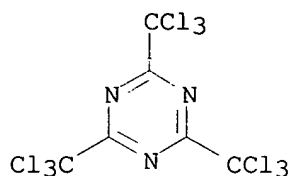
RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of)

RN 368-66-1 HCAPLUS

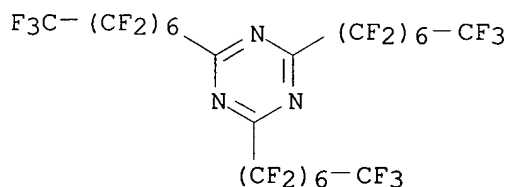
CN 1,3,5-Triazine, 2,4,6-tris(trifluoromethyl)- (9CI) (CA INDEX NAME)



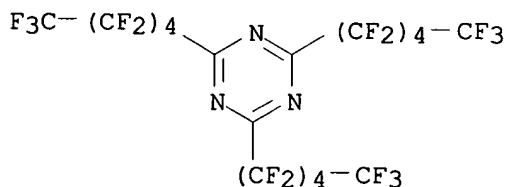
RN 6542-67-2 HCAPLUS
CN 1,3,5-Triazine, 2,4,6-tris(trichloromethyl)- (9CI) (CA INDEX NAME)



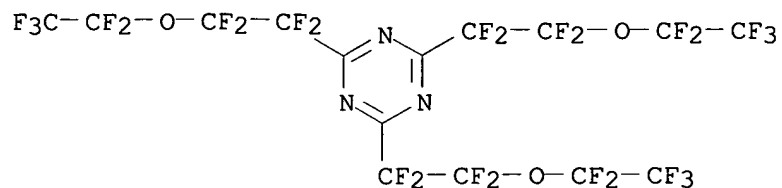
RN 21674-38-4 HCAPLUS
CN 1,3,5-Triazine, 2,4,6-tris(pentadecafluoroheptyl)- (9CI) (CA INDEX NAME)



RN 23790-50-3 HCAPLUS
CN s-Triazine, 2,4,6-tris(undecafluoropentyl)- (8CI) (CA INDEX NAME)

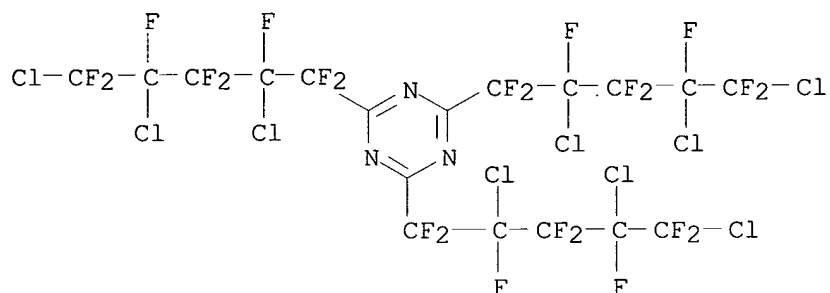


RN 24142-25-4 HCAPLUS
CN s-Triazine, 2,4,6-tris[tetrafluoro-2-(pentafluoroethoxy)ethyl]- (8CI) (CA INDEX NAME)



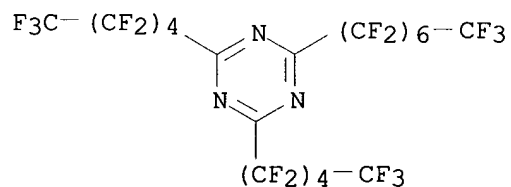
RN 25240-03-3 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(2,4,5-trichloro-1,1,2,3,3,4,5,5-octafluoropentyl)- (9CI) (CA INDEX NAME)



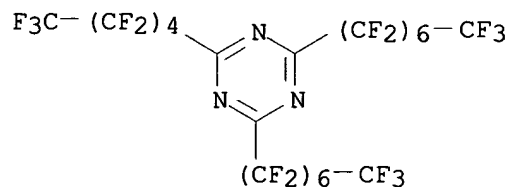
RN 25325-51-3 HCAPLUS

CN s-Triazine, 2-(pentadecafluoroheptyl)-4,6-bis(undecafluoropentyl)- (8CI) (CA INDEX NAME)



RN 25455-82-7 HCAPLUS

CN s-Triazine, 2,4-bis(pentadecafluoroheptyl)-6-(undecafluoropentyl)- (8CI) (CA INDEX NAME)



L51 ANSWER 34 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1969:449988 HCAPLUS

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

DN 71:49988
 TI Catalytic preparation of triazines and **polymers** of nitriles
 IN Emerson, William E.; Dorfman, Edwin
 PA Hooker Chemical Corp.
 SO Fr., 6 pp.
 CODEN: FRXXAK
 DT Patent
 LA French
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 1554658	A	19690124	FR 1967-116758	19670803
	NL 155569	B	19780116	NL 1967-10727	19670803
	NL 7711161	A	19780228	NL 1977-11161	19771011
PRAI	US 1966-570183	A	19660804		

AB Thermally stable triazines and nitrile **polymers** useful as lubricants, solvents, and in the preparation of molded articles are prepared by condensing a nitrile in the presence of metallic oxides. Thus, 130 parts **perfluorobutyronitrile** was heated under N in an autoclave in the presence of 1 part Ag₂O at 70° and 8 kg./cm.² for 24 hrs., heated 6 days at 80° and 7.3 kg./cm.², the pressure released to 1.4 kg./cm.², the mixture cooled, the pressure lowered to 0 atmospheric, and 128 parts

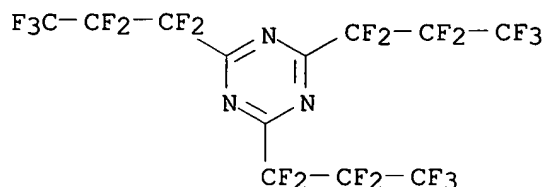
2,4,6-tris(**perfluoropropyl**)-s-triazine distilled at 42-5°/1 mm. Other catalysts used were As₂O₃, Bi₂O₃, CaO, CdO, Co₂O₃, CuO, Fe₂O₃, HgO, PbO, PbO₂, Pb₃O₄, BaO, Sb₂O₃, Sb₂O₅, TiO₂, Ti₂O₃, Y₂O₅, Y₂O₃, ZnO, and Mn₃O₄. Similarly **perfluoroglutaronitrile** was condensed to give a product m. 159° with intrinsic viscosity 0.03 dl./g. (1,2-dimethoxyethylene). Other nitriles used were **perfluoro**-octanonitrile, HCF₂CN, ClCF₂CN, PhCN **perfluorosuccino**-nitrile, CF₃CN, CF₃CF₂CN, **perfluoromalonitrile**, bromotetra-**fluoropropionitrile**, bromooctafluorovaleronitrile, nonafluoro-3-thiabutyronitrile(?), **perfluoroethyladiponitrile**, **perfluorovalero**-nitrile, 4-bromoperfluorobutyronitrile, **perfluorosuber**onitrile, **perfluoroadiponitrile**, **perfluorotetradecanedinitrile**, **perfluoromethoxypropionitrile**, or **perfluoroethoxy**-propionitrile.

IC C07D
 CC 28 (Heterocyclic Compounds (More Than One Hetero Atom))
 ST **nitriles trimerization; trimerization**
nitriles; fluoronitriles trimerization;
 triazines prepn; **polymn dinitriles**

IT **915-76-4P**
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of)

IT **915-76-4P**
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (preparation of)

RN 915-76-4 HCAPLUS
 CN 1,3,5-Triazine, 2,4,6-tris(heptafluoropropyl)- (9CI) (CA INDEX NAME)

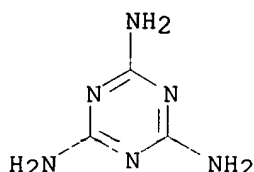


- L51 ANSWER 35 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1968:40654 HCAPLUS
 DN 68:40654
 TI Use of **polymers** in current sources.
 AU Toroptseva, T. N.
 SO Elektrotehnika (1967), (8), 8-10
 CODEN: ELKTAQ; ISSN: 0013-5860
 DT Journal
 LA Russian
 AB Use of **polymers** as construction materials in storage battery cases, **membranes** and matrixes in the **electrolyte** containing devices, **polymeric electrolytes**, and insulation, sealing, and protective materials in current sources was discussed. Chemical resistance of polyethylene, polypropylene, **polyfluorocarbons**, polyisobutylene, acrylonitrile-styrene copolymers in acidic and alkaline **electrolytes**, of polyamide 68, melamine-formaldehyde molding material, and epoxide resin sealing composition in alkaline **electrolyte**, and of glass-reinforced material AG-4 and polycarbonate in acidic **electrolyte** was studied. For Ag-Zn alkaline batteries, regenerated cellulose **membrane** separators were used and effect of the **membrane** structure on the chemical and mech. properties was determined
 CC 37 (**Plastics** Fabrication and Uses)
 ST BATTERY STORAGE **POLYMER** CASES; STORAGE BATTERY **POLYMER** CASES; **POLYMER** STORAGE BATTERY CASES
 IT Resins, epoxy, uses and miscellaneous
 RL: USES (Uses)
 (battery containers from, **electrolyte** resistance of)
 IT Batteries, secondary
 (plastic containers and separators for)
 IT **Fluorocarbons**
 RL: USES (Uses)
 (polymers, battery containers from, **electrolyte** resistance of)
 IT AG 4
 RL: USES (Uses)
 (battery containers from, **electrolyte** resistance of)
 IT 9002-88-4, uses and miscellaneous 9003-08-1 9003-27-4, uses and miscellaneous 9003-54-7, uses and miscellaneous
 RL: USES (Uses)
 (battery containers from, **electrolyte** resistance of)
 IT 463-79-6, Carbonic acid
 RL: USES (Uses)
 (polyesters, battery containers from, **electrolyte** resistance of)
 IT 9003-08-1
 RL: USES (Uses)
 (battery containers from, **electrolyte** resistance of)

RN 9003-08-1 HCAPLUS
 CN 1,3,5-Triazine-2,4,6-triamine, polymer with formaldehyde (9CI) (CA INDEX NAME)

CM 1

CRN 108-78-1
 CMF C3 H6 N6



CM 2

CRN 50-00-0
 CMF C H2 O

H₂C=O

L51 ANSWER 36 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1967:422455 HCAPLUS

DN 67:22455

TI **Polymers** having recurring triazine rings

IN Fritz, Charles G.; Warnell, Joseph L.

PA du Pont de Nemours, E. I., and Co.

SO U.S., 7 pp.

CODEN: USXXAM

DT Patent

LA English

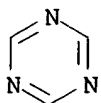
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3317484		19670502	US	19621123

AB **Perfluoroether** dinitriles were synthesized and homopolymd. or copolymd. with each other. **Polymerization** occurred by **trimerization** of the **nitrile** groups to form triazine rings. Thus, a slurry of 6 g. CsF, 60 ml. MeCN, and 28 ml. **perfluoroglutaric fluoride** was heated to 40° and **hexafluoropropylene** oxide was pressured in at 5 psig. After 0.25 mole of the oxide had been absorbed, the heavy **fluorocarbon** layer was removed and distilled in an anhydrous atmospheric to yield **perfluoro-2-methyl-3-oxasuberoyl fluoride** (I), b. 101°. I was cooled to 0° in a polyethylene container, an excess of MeOH was added, and the mixture was poured into ice water to sep. the di-Me ester of I. A stream of NH₃ was passed into a solution of 300 g. of the ester in 500 ml. Et₂O at 0°, and after 4 hrs. the Et₂O was evaporated to yield **perfluoro-2-methyl-3-oxasuberamide** (II), m. 145-7°. II was dried over P₂O₅ and then 120 g. was mixed with 900 g. P₂O₅, and heated at 190-200° for 3 hrs. The mixture was distilled to yield pure

perfluoro-2,7-dicyano-3-oxaheptane, b. 100°.
Perfluoro-2,4-dicyano-3-oxabutane, **perfluoro-2,7-dicyano-3,6-dioxaoctane** (III), **perfluoro-2,10-dicyano-3,9-dioxaundecane**, $\text{NCCF}_2\text{O}(\text{CF}_2\text{CF}_2)_n(\text{CF}_2)_5(\text{OCF}_2\text{CF}_2)_m\text{OCF}_2\text{CN}$ where $m + n =$ an average of 2 or 6, and $\text{NC}(\text{CF}_2)_4(\text{OCF}_2\text{CF}_2)_p\text{OCF}_2\text{CN}$ where $p =$ an average of 3 or 7, were similarly prepared. Diamidines of the compds. were prepared by cooling the dinitrile in a tube to -40° and adding an excess of NH_3 . After 2 hrs., a diamidine had formed and the tube was cooled, evacuated, and sealed. The diamidine of III 1.5, III 8.5, and **perfluorosuccinonitrile** were mixed in a tube cooled to liquid N temperature, evacuated, and sealed. After heating for 18 hrs. at 145° and 2 hrs. at 190°, the tube was opened and the viscous prepolymer was cured in a mold by exposure to the air at 200° for 24 hrs. A hard thermoset resin casting was obtained. Similar copolymers were prepared with **perfluoroglutaronitrile**, **perfluoroadiponitrile**, or **perfluorosuberitrile**.

- NCL 260078400
 CC 36 (**Plastics** Manufacture and Processing)
 ST **PERFLUORO ETHERS DICYANO POLYMN**; **ETHERS DICYANO PERFLUORO POLYMN**; **TRIAZINE POLYMERS**; **FLUOROPOLYMERS TRIAZINES**; **POLYMN DICYANO PERFLUORO ETHERS**; **DICYANO PERFLUORO ETHERS POLYMN**
 IT **Perfluoro** compounds
 RL: PREP (Preparation)
 (ether dinitriles, preparation and polymers with s-triazine structure from)
 IT **Plastics**
 RL: USES (Uses)
 (from **perfluoroether** dinitrile polymers with recurring s-triazine rings)
 IT Nitriles, **polymers**
 RL: USES (Uses)
 (with s-triazine rings, from **perfluoroether** dinitriles)
 IT 15721-03-6 15721-04-7 15742-63-9 16835-47-5
 RL: USES (Uses)
 (**polymers** with amidines of **perfluoro** dinitriles, s-triazine ring-containing)
 IT 376-53-4 376-89-6 663-41-2 3885-85-6
 RL: USES (Uses)
 (**polymers** with amidines of **perfluoro** ether dinitriles, s-triazine ring-containing)
 IT **290-87-9D**, s-Triazine, derivs.
 RL: USES (Uses)
 (**polymers**, from **perfluoro** dinitriles and **perfluoroether** dinitriles)
 IT **290-87-9D**, s-Triazine, derivs.
 RL: USES (Uses)
 (**polymers**, from **perfluoro** dinitriles and **perfluoroether** dinitriles)
 RN 290-87-9 HCAPLUS
 CN 1,3,5-Triazine (9CI) (CA INDEX NAME)



L51 ANSWER 37 OF 37 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1960:28787 HCAPLUS

DN 54:28787

OREF 54:5687a-d

TI **Fluorine**-containing nitrogen compounds. II.

Trimerization of trifluoroacetonitrile

AU Bissell, Eugene R.; Spengler, Robert E.

CS Ernest O. Lawrence Radiation Lab., Livermore, CA

SO Journal of Organic Chemistry (1959), 24, 1147-8

CODEN: JOCEAH; ISSN: 0022-3263

DT Journal

LA Unavailable

OS CASREACT 54:28787

AB The use of hydrogen chloride as a catalyst in the **trimerization** of **trichloroacetonitrile** (I) to 2,4,6-tris(**trifluoromethyl**)-1,3,5-triazine (II) was found to give yields in excess of 90% based on the unrecovered nitrile. BF₃ was ineffective at low temps. I was prepared by dehydration of **trifluoroacetamide**. Trimerizations were effected in a bomb. The reactants were measured as gases in a calibrated bulb with a pressure gage. They were condensed in an outgassed bomb by means of liquid N. The bomb was allowed to warm to room temperature and kept at the specific temperature for 18-20 hrs.; temps. between

100 and 150° were maintained. The bomb was cooled, and reconnected to the vacuum manifold, the contents pumped slowly through 2-traps, the first at -78° and the 2nd at -196°. The amount in the 2nd trap was measured gasometrically. Infrared analysis showed it to consist mainly of HCl with varying amts. of unreacted I. The material from the -78° trap was distilled in vacuo and found to contain trimer contaminated by a little HCl. A typical sample of II had n_D²⁵ 1.32208, d_{23.5} 1.595. The following results were obtained (millimoles of I and of HCl, ratio, temperature, recovery millimoles gas, liquid, % recovery, and % yield given): 32.35, 8.1, 4.0, room temperature between 10-30°, 11.6, 26.9, 95.3, 83.3; 32.41, 8.1, 4.0, 100°, -, 15.0, -, 46.3; 31.81, 7.7, 4.1, 100°, 26.5, 11.8, 97.0, 37.0; 32.08, 6.3, 5.1, 150°, 32.5, 5.3, 98.3, 16.4; 32.58, 6.4, 5.1, 150°, 32.9, 4.5, 96.1, 13.9; 31.9, 15.7, 2.0, 10-30°, 16.0, 25.6, 87.4, 80.0; 32.4, 16.2, 2.0, 100°, 22.9, 21.9, 92.1, 67.6; 32.1, 32.2, 1.0, 10 30°, 20.3, 30.2, 78.7, 94.1; 32.9, 32.2, 1.0, 100°, -, 28.2, -, 85.7; 31.7, 32.7, 1.0, 125°, 36.7, 23.8, 94.8, 75.0; 33.0, 32.7, 1.0, 150°, 37.1, 24.7, 94.1, 74.9; 32.7, 32.1, 1.0, 10-30°, 33.1, 18.8, 80.2, 57.7.

CC 10G (Organic Chemistry: Heterocyclic Compounds)

IT Catalysts

(in **trimerization** of **trifluoroacetonitrile**, HCl as)

IT **Polymerization**

(**trimerization**, of **trifluoroacetonitrile**)

IT 7647-01-0, Hydrochloric acid

(catalysts, in **trimerization** of **trifluoroacetonitrile**)

IT 7782-41-4, **Fluorine**

(compounds, nitrogen-containing)

IT **368-66-1**, s-Triazine, 2,4,6-tris(**trifluoromethyl**)-

186958-04-3, Nitrogen, compound with **fluorine**

(preparation of)

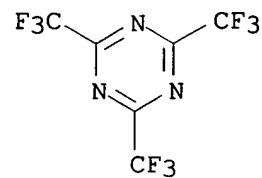
IT 353-85-5, **Acetonitrile**, **trifluoro-**

(**trimerization** of)

IT 368-66-1, s-Triazine, 2,4,6-tris(trifluoromethyl)-
(preparation of)

RN 368-66-1 HCAPLUS

CN 1,3,5-Triazine, 2,4,6-tris(trifluoromethyl)- (9CI) (CA INDEX NAME)



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